



Zootaxa 2486: 1–60 (2010)

www.mapress.com/zootaxa/

Copyright © 2010 · Magnolia Press

Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

2486

Revision of the Australo-Papuan genus *Macrolema* Baly (Coleoptera: Chrysomelidae: Spilopyrinae), with description of a new genus

C. A. M. REID & M. BEATSON

Department of Entomology, Australian Museum, 6 College Street, Sydney, NSW 2010, Australia.

Email: chris.reid@austmus.gov.au; max.beatson@austmus.gov.au



Magnolia Press
Auckland, New Zealand

Accepted by G. Morse: 16 Apr. 2010; published: 27 May 2010

C. A. M. REID & M. BEATSON

**Revision of the Australo-Papuan genus *Macrolema* Baly (Coleoptera: Chrysomelidae: Spilopyrinae),
with description of a new genus**
(*Zootaxa* 2486)

60 pp.; 30 cm.

27 May 2010

ISBN 978-1-86977-543-8 (paperback)

ISBN 978-1-86977-544-5 (Online edition)

FIRST PUBLISHED IN 2010 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

© 2010 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of contents

Introduction	3
Methods	4
<i>Allsortsia</i> gen. nov.	5
<i>Allsortsia maculata</i> (Lea 1922) comb. nov.	7
Key to the genera of Spilopyrinae	8
<i>Macrolema</i> Baly 1861	9
Key to species of <i>Allsortsia</i> Reid & Beatson and <i>Macrolema</i> Baly	11
<i>Macrolema aenescens</i> (Bowditch 1913)	12
<i>Macrolema albascutica</i> sp. nov.	13
<i>Macrolema atripennis</i> (Bowditch 1913)	14
<i>Macrolema dickdaviesi</i> sp. nov.	16
<i>Macrolema giya</i> sp. nov.	17
<i>Macrolema karimui</i> sp. nov.	18
<i>Macrolema longicornis</i> Jacoby 1895	19
<i>Macrolema metallica</i> (Lea 1922)	20
<i>Macrolema pulchra</i> sp. nov.	22
<i>Macrolema quadrivittata</i> (Jacoby 1898)	23
<i>Macrolema submetallica</i> (Jacoby 1894)	24
<i>Macrolema ventralis</i> (Lea 1921)	26
<i>Macrolema vittata</i> Baly 1861	27
Acknowledgments	29
References	30
Figures 1–134	32–59

Abstract

The chrysomelid genus *Macrolema* Baly 1861 is revised. 13 species are described including five new: *Macrolema aenescens* (Bowditch 1913), *M. albascutica* **sp. nov.**, *M. atripennis* (Bowditch 1913), *M. dickdaviesi* **sp. nov.**, *M. giya* **sp. nov.**, *M. karimui* **sp. nov.**, *M. longicornis* Jacoby 1895, *M. metallica* (Lea 1922), *M. pulchra* **sp. nov.**, *M. quadrivittata* (Jacoby 1898), *M. submetallica* (Jacoby 1894), *M. ventralis* Lea 1921b, *M. vittata* Baly 1861. *Macrolema vittata* is a senior synonym of *M. marginata* Jacoby 1898 (**syn. nov.**). *Allsortsia* **gen. nov.**, is erected for a species formerly in *Macrolema*, *Allsortsia maculata* (Lea 1922), **comb. nov.** Lectotypes are designated for *Macrolema longicornis*, *M. vittata* and *Macrogonus quadrivittatus*. Keys are provided for identification of the genera of Spilopyrinae and for the species of *Macrolema*. *Macrolema* is confined to the eastern rainforests of Australia (11 species) and highland New Guinea (2 species). Little is known of the biology of the species of *Macrolema* and *Allsortsia*, all of which are relatively rarely collected. A first-instar larva is tentatively ascribed to *Macrolema*.

Key words: fiery leaf beetle, morphology, Australia, New Guinea, taxonomy

Introduction

The chrysomelid subfamily Spilopyrinae (fiery leaf beetles) includes some of the most spectacularly coloured beetles in the world. However the group is relatively poorly known, as it has only recently been recognised and is confined to relatively remote regions of the east coast of Australia, the highlands of New Guinea, New Caledonia and southern South America (Reid 2000).

Macrolema Baly 1861 was erected for a single Australian species which Baly placed in the Crioceridae, at that time poorly circumscribed, including genera from several unrelated subfamilies (Chapuis 1874; Reid 2000). Baly noted some similarity to *Megascelis* Sturm 1826, then also placed in Criocerinae but currently in Eumolpinae (Reid 1995, 2000). Chapuis (1874) suggested the greatest similarity was with *Brachydactyla* Lacordaire 1845 (now *Pseudocrioceris* Pic 1916) which is certainly a criocerine (material examined). *Macrogonus* Jacoby 1894, was erected for a similar curiously structured Australian criocerine, which only differed from *Macrolema* by the strongly produced pronotal lateral margins (see comments in Jacoby and

Clavareau 1904). By 1951, *Macrolema* and *Macrogonus*, with a total of 10 species, were still retained in Criocerinae (Monrós 1951). However the beetle morphologist Crowson was at this time working on a reclassification of the Coleoptera, and was in regular correspondence with Monrós, who was revising the world Criocerinae. Crowson noted similarity between *Macrolema* and other genera and placed these in Eumolpinae, as the most 'primitive' members of that subfamily (Crowson 1953). Monrós (1958) supported this placement, from his own studies. This group of genera was elevated to subfamily based on phylogenetic analysis of chrysomelid morphology (Reid 1995, 2000). The oldest family rank stem name is Spilopyr-Chapuis 1874, made available under Article 11.7 (International Commission on Zoological Nomenclature 1999) by Lefèvre (1885).

Macrogonus, not mentioned by Crowson or Monrós, became a junior synonym of *Macrolema* in the world checklist of Chrysomelidae (Seeno & Wilcox 1982), probably on the strength of comments by Lea (1921a), and together these two names were placed *incertae sedis* in Eumolpinae.

In a study of the phylogeny of Chrysomelidae based on traditional morphology (Reid 1995), the four putative tribes of Eumolpinae were analysed separately: 'Eumolpini' (equivalent to Eumolpinae excluding the next three taxa), Megascelidini, Synetini and Spilopyrini (including *Macrolema*). In this analysis larval characters were lacking for Megascelidini and Spilopyrini, but it was noted that evidence for monophyly of the four taxa was weak. The analysis was repeated after discovery of larvae for all the taxa (Reid 2000) and it was clear that Spilopyrini were sister to a larger entity than Eumolpinae alone, so the group was elevated to subfamily rank as Spilopyrinae. This status is supported in recent molecular phylogenies, although the exact relationship to other families remains unclear (Gomez-Zurita, Jolivet & Vogler 2005; Gomez-Zurita, Hunt, Kopliku & Vogler 2007; Gomez-Zurita, Hunt & Vogler 2008).

A brief diagnosis was provided for *Macrolema* in the review of Spilopyrinae (Reid 2000), with a checklist of included species. The distinctive genus *Richmondia* Jacoby 1898 was noted as a possible synonym of *Macrolema* but is retained as a separate genus here pending a phylogenetic analysis of the whole subfamily. We have examined all type material, all specimens in the Natural History Museum, London, and all major collections in Australia for *Macrolema*. Other collections are unlikely to have significant numbers of specimens. There are 13 species, including 5 new and one new synonym, all of which are described below, with a key to the species. As a result of this study it was discovered that both the subfamilial and generic descriptions given by Reid (2000) need to be altered. All species of *Macrolema* lack a kotpresse, two have a reduced tibial spur formula and two species have some movement between the normally fused first two ventrites, states which weaken these characters in the diagnosis of Spilopyrinae. However other adult characters provided in the key to subfamilies of Chrysomelidae remain valid. The larval characters appear to be the best diagnostic tool for the subfamily. Here we tentatively identify a described but previously unknown larva as *Macrolema* (Reid 2000).

One described species differs markedly from all other *Macrolema* species and other spilopyrines. We provide a new genus for this species below.

Most *Macrolema* species are easily recognised from distinctive colour patterns combined with external morphology, however we provide full illustrations of male and female genitalia to aid further work on the group.

Methods

This is a traditional taxonomic paper based on descriptive morphology. Genitalia were prepared for examination by: removal of abdomen, maceration for 3–5 hours in cold 10% KOH, washing in water, cleaning the residue, transfer to glycerol on a cavity slide for microscopy. The cleaned abdominal sclerites were dried and pointed and the genitalia stored in glycerol in a polythene microvial, pinned with the rest of the specimen.

Lengths are given to the nearest 0.5mm, but body and segment ratios were calculated from measurements made by eyepiece micrometer. Antennal segment ratios were measured from a single specimen of each sex. These ratios are indicative of variation between species rather than definitive, as precise boundaries of

segments vary according to preservation of the specimens; furthermore most species are represented by few specimens. All measurements and ratios should therefore be regarded as approximate. All specimens were examined for surface sculpture, which is variable in most species of this genus.

Traditional comparative terms for size and density of punctures are included in the descriptions, but are only interpretable by reference to the photographs. The punctures are variable between individuals within a species but extremes are distinct; contrast size and density of punctures in Figures 1-31.

Male and female genitalia of each species are illustrated, from drawing-tube outlines made from preparations in glycerol on cavity slides. Due to lack of material only one or two specimens of each sex were dissected. The male internal sclerites include a small remnant of sternite VIII, the spiculum relictum (Lawrence, Beutel, Leschen & Slipinski 2010), which significantly varies between species. The penis is a simple slightly flattened tube, presenting few diagnostic characters, therefore generally only the apex is illustrated. In some specimens the endophallus was preserved in everted state (Figs 82, 87, 89, 93). The everted portion in these specimens was membranous, lacking any significant sclerites, and lobes if present were short, therefore it was not studied further. A long sclerotised portion of the centre of the endophallus may be present, but is not or only partially everted and is poorly defined when examined through the walls of cleared penises. This sclerite or sclerotised region is probably an ejaculatory guide, holding the flagellum or apex of the ejaculatory duct in place, similar to the much more clearly defined structure in *Cryptocephalinae* (Karren 1966; Reid 1991). As it is difficult to examine without damaging the specimen it was not studied for this taxonomic review. An elongate median ventral sclerite is present between the gonocoxites of some *Spilopyrinae* (fig. 96; Reid 1992: 111). This sclerite lacks setae or clusters of sensilla and therefore may represent secondary thickening of membrane. The spermathecae and ducts show significant differences between species. Spermathecae are drawn as if in cross-section, to illustrate the junction of both gland and duct. The duct in most species is entirely tightly coiled. The exact number and pattern of coils is not diagnostically significant in these species, so for most species only the ends of the duct are illustrated, with a line between indicating the route of that portion of the similarly coiled duct which is omitted. The spermathecal gland is a long spatulate unbranched tube after clearing with KOH, without diagnostic properties and therefore only illustrated for one species (Fig. 120).

Label data are given as found on specimens; labels are separated by //.

Abbreviations

Collections: AMS (Australian Museum, Sydney), ANIC (Australian National Insect Collection, Canberra), BMNH (Natural History Museum, London), MCZ (Museum of Comparative Zoology, Harvard), MVM (Museum of Victoria, Melbourne), QDPIM (Queensland Department of Primary Industry, Mareeba), QMB (Queensland Museum, Brisbane), SAM (South Australian Museum, Adelaide), UQB (University of Queensland, Brisbane).

Localities: CQ = Central Queensland, FR = Flora Reserve, NG = New Guinea, NP = National Park, NQ = North Queensland, NNSW = North New South Wales, NSW = New South Wales, QLD = Queensland, SF = State Forest, SQ = South Queensland.

Allsortsia gen. nov.

Type species: *Macrogonus maculata* Lea 1922, this designation

Diagnosis

Length 12–13mm; shape elongate-ovoid; dorsum not pubescent; eyes small, gena c. 0.6x eye length; antennae c.0.5x body length; pronotum widest at middle (male laterally produced), and width at posterior angles greater than width at anterior angles; lateral margination of pronotum absent; prosternal process transverse, depressed between coxae, apex bilobed; elytra evenly convex in lateral view, non-striate, without depressions on disc; male tibiae curved; tibial spurs 1+2+2; claw simple, with slight angulation at base of ventral margin; junction ventrites I and II fused at sides, with some movement at middle.

Description of *Allsortsia*

Length 12–13mm; body (Figs 1–2) elongate-ovate, without marked constriction at junction of elytra and pronotum, but head remarkably narrow, c. 0.5–0.6x width pronotum; body moderately to shallowly convex in profile, length 2.8x height. Dorsum shining and smooth, multicoloured, with some metallic reflection, glabrous except trichobothria adjacent to eyes and on each corner of pronotum.

Head (Figs 1–2, 18): fronto-clypeus smooth, triangular, anterior margin shallowly concave, not depressed between eyes and elevated towards apex; eyes ovate, height c. 1.4x width, inner margin shallowly concave; eye laterally projecting, posterior curvature contiguous with short temples, which are abruptly constricted to parallel-sided head capsule; gena 0.5–0.6x greatest eye length; antennae c. 4.5x socket diameters apart; antennae c. 0.5x body length; antennomere 1 enlarged cylindrical, 2 shortest (c. 0.6x first), 3 equal to 1, antennomeres 6–11 almost parallel-sided, 7–11 longest; antennomeres 1–5 shining and sparsely punctured, 6–11 dull and densely microsculptured; labrum not densely setose, with 1–2 pairs of median setae and extra setae at lateral margins; mandible with single apical tooth; apical maxillary palpomere elongate fusiform, with narrow apex (both sexes); preapical palpomere triangular, shorter than apical, and of similar width; mentum transverse, width c. 3x median length, but anterior angles narrowly produced.

Thorax (Figs 1–2, 18, 41, 44): pronotum transverse, width 1.25x length, broadest near middle and strongly contracted to anterior angles; disc with or without depressions; anterior edge deeply concave, posterior medially bilobed, lateral edges convex or medially lobed; anterior partly and base distinctly margined, lateral margination absent; anterior and posterior angles laterally prominent, each with single trichobothrium; posterior angle at same vertical plane as posterior margin of hypomeron; prosternum flat between coxae and head; prosternal process broad and flat, with bilobed apex; procoxal cavities closed by insertion of hypomeral lobes into prosternal process; scutellum semi-ovate; elytra broadest at base, with strongly developed humeri, without median depressions; without distinct striae; elytral epipleuron narrow, width <0.2x elytral width, entirely visible laterally but upper margin effaced before humerus, slightly sinuate, gradually contracted from base to apex, and without setae; mesoventrite entirely visible, with quadrate median process; wings fully developed, with two large subequal cells and 4 longitudinal veins in the cubito-anal region, anterior to the weakly indicated anal fold; metaventrite transverse, width c. 2x length, without femoral plates; all femora fusiform, with base and apex narrowed, without longitudinal keels or ridges; all tibiae round in section, without keels, thin, with abruptly expanded apices; short spur on protibia present, 2 on remainder; all first tarsomeres with ovate patch of modified setae in males, with dense simple setae diverging from midline in females; apex second tarsomere concave; third tarsomere deeply bilobed, lobes c. 1.5x median length; claws simple, without basal tooth.

Abdomen (Figs 60, 66, 67, 81, 96, 98, 128): pygidium (tergite 7) not greatly thickened, basal half membranous, apical half densely pubescent and punctured, without median groove; tergite VIII not fused to spiracles; ventrite I with triangular intercoxal process and without femoral plates; ventrites I and II not completely fused, with some movement at middle; ventrite V smooth, not medially depressed, and truncate or convex at apex in both sexes, but shorter in male; sternite VIII of male Y-shaped; sternite IX of male Y-shaped; male tegmen present, enclosing penis, U-shaped, thinly sclerotised and with slight internal median keel; penis simple, flattened tubular, with basal foramen c. 0.4x length of penis; vas deferens with long thickened sperm pump; female tergite VIII well-developed, sternite VIII with basal apodeme; ovipositor with pair of well-developed paraprocts, enclosed at base by thin baculus, and partly enclosing basal half of palpi, pair of well-defined elongate proctigers dorsal to these; vaginal palpi 3-segmented, apical segment (gonostylus) elongate cylindrical, basal segments (gonocoxite) massive; elongate median ventral sclerite present between gonocoxites; spermatheca hook-shaped; kotpresse present in rectum, as a poorly defined band of elongate spinules.

Distribution and biology

Allsortsia is confined to Australia, where it occurs in the tropical rainforest of north Queensland. The single species is known from two pre-1920 specimens. The biology is unknown, but is likely to be similar to other Spilopyrinae (Reid 2000), with an external larva feeding on leaf laminae.

Etymology

Allsortsia is named from the vague resemblance of the type species to liquorice allsorts, a childhood favourite of the senior author. The gender is feminine.

Notes

Allsortsia differs from *Macrolema* by: head structure, antennal length, sexually dimorphic pronotal shape, prosternal process, elytral sculpture, upper margin of epipleura, sexually dimorphic tibiae, almost glabrous ventrites, vaginal palpi, presence of kotpresse. *Allsortsia* is similar to *Spilopyra* Baly 1860, from which it differs by: anteriorly elevated frontoclypeus, absent lateral pronotal margins, prosternal process medially depressed and apicolaterally lobed, elytra not transversely depressed, reduced spiculum relictum, 3-segmented vaginal palpi. *Allsortsia* has less in common with the four remaining spilopyrine genera (Reid 2000).

There is a single known species, redescribed below.

Allsortsia maculata (Lea 1922), comb. nov.

(Figs 1, 18, 41, 44, 60, 66, 67, 81, 96, 98, 128, 130)

Macrogonus maculatus Lea 1922: 283

Macrolema maculata: Reid 2000: 862

Material examined

Holotype: male/ *maculatus* Lea type Cairns/ *Macrogonus maculatus* Lea Queensland I.4773 type/ (SAM). Paratype: female/ Kuranda N Queensland G. E. Bryant F. P. D[odd]. 1909/ type of female *Macrogonus maculatus* Lea Queensland male has large tooth on each side of prothorax cotype/ cotype/ Australia Brit. Mus. 1921-458/ (BMNH).

The female lacks antennomeres 7–11.

Description

Length: male 12mm, female 13mm; body moderately convex in profile, length c. 3x height. Variegated in metallic blue, red, yellow and brown: (i) anterior of head, head appendages, legs, basal half of middle of pronotum, scutellum, basal third of elytral suture and 6 spots on each elytron (beside scutellum, near suture 1/3 from base, on humerus, behind humerus, near side 1/2 from base, near side 3/4 from base), black to blackish-brown, with dark blue reflection; (ii) remainder of elytra yellow; (iii) remainder of prothorax, mesoventrite, middle of metaventrite and base of trochanters red to reddish-yellow; (iv) abdomen brown.

Head (Figs 1–2, 18): relatively small; strongly and closely punctured throughout anterior half, almost impunctate posteriorly; frontoclypeal margins deeply defined but not depressed between eyes, with deep groove on midline of vertex and irregular groove with trichobothria behind eyes; eyes small, not prominent, flatter in female, separated by c. 4x eye widths (both sexes); gena long, 0.55–0.60x eye length; antennae c. 4.5x socket diameters apart; antennae short, c. 0.5x body length (male), broken in female; all antennomeres elongate: 2 shortest (c. 0.6x first), <1=3, <4=6, <5=8, <7=9=10, <11 (male), female antennomeres 1–6 similar; labrum with 4–5 pairs of prominent lateral setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female; preapical palpomere shorter than apical.

Thorax (Figs 1–2, 18, 41, 44): pronotum sparsely and finely punctured throughout, with larger punctures on basal dark mark, shining, with scattered distinct micropunctures between macropunctures; pronotal shape sexually dimorphic: both sexes pronotal width 1.25x length, but male with strongly developed triangular lateral lobes at middle and deeply concave anterior margin, female evenly convex at sides and shallowly concave anterior margin; pronotal basal margin narrowly excavate at midline; posterior trichobothria anterior to basal margin; pronotal disc convex and without depressions in male, with two small lateral depressions in female; anterior margination absent from middle half; hypomeron impunctate; prosternal process broad and depressed, with two oblique lobes at apex; scutellum punctate, almost semicircular; elytron without

depressions on basal half of disc; elytral punctures strong and close in basal half, evanescent towards apex; elytra non-striate, with interstitial punctures as large as striae and the latter not in regular lines; 1 deep depression on basal half of elytron adjacent to epipleuron; upper margin epipleuron not reaching base of elytron, obliterated before humerus; mesoventrite median process strongly arched to shallowly concave apex; metaventrite shining and sparsely and minutely punctured, anterior of middle without depression and without margination, edge pitted laterally; metepisternum microreticulate, finely punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 60, 66, 67, 81, 96, 98, 128): basal half pygidium (tergite 7) without pubescence and punctures; ventrites I and II not completely fused, with some movement at middle; ventrites I–V smooth and shining, not microreticulate, sparsely and minutely punctured, on apical half of I–II, and most of III–V, pubescence just visible at $\times 40$, except a pair of trichobothria on each ventrite; ventrite I with small lateral keel $<0.25\times$ ventrite length, other ventrites without keels; apex ventrite V convex in both sexes; apex of penis triangular in dorsal view, apical angle $c.80^\circ$, tip slightly curved thickened in lateral view; female sternite VIII with elongate narrow basal apodeme; apex of gonocoxite setose, setae as long as stylus; spermatheca hook-shaped, with loosely coiled duct.

Notes

Allsortsia maculata is only known from the two type specimens, collected in 1909 at Kuranda in the Wet Tropics bioregion (Fig. 130). The label data of the types suggests that two separate collections were made, but in the description Lea (1922: 284) states that both specimens were collected in the “Cairns district” by F. P. Dodd and G. E. Bryant. We therefore believe that Lea replaced the original labels with his own, as was his practice when writing out new type labels (*pers. obs.* CAMR). Months of activity are unknown. *Allsortsia maculata* may reasonably be considered ‘Endangered’ in conservation status (International Union for Conservation of Nature 2001), given its rarity, large size and restricted distribution.

Key to the genera of Spilopyrinae

This key is modified from Reid (2000), in which elytra of *Hornius* were wrongly described as pubescent, which is only true for *H. grandis* (Philippi & Philippi 1864), and erroneous distributions were given for the South American genera (see Jerez 1996).

- | | | |
|------|---|-----------------------------|
| 1 | Lateral margins of pronotum with a distinct raised border | 2 |
| - | Lateral margins of pronotum without raised border | 5 |
| 2(1) | Dorsum brown and non-metallic; pronotum broadest at middle, contracted anteriorly and posteriorly; length 7–9mm (Argentina and Chile) | <i>Hornius</i> Fairmaire |
| - | Dorsal surface glabrous, usually partly metallic and black; pronotum shaped otherwise; length 9–15mm | 3 |
| 3(2) | Dorsal surface wholly metallic, with spots and bands; body broader (length at most $1.8\times$ width) and profile strongly raised in middle (Australia and New Guinea) | <i>Spilopyra</i> Baly |
| - | Dorsal surface brown or non-metallic green; body more elongate (length at least $2.5\times$ width) and not arched longitudinally | 4 |
| 4(3) | Prosternal process narrow and feebly curved longitudinally, broadly expanded and shallowly bilobed at apex; basal half of elytra semistriate; anterior tibia with 2 apical spurs; basal ventrites not fused (Chile) | <i>Stenomela</i> Erichson |
| - | Prosternal process flat, broad, parallel-sided, posteriorly raised and deeply bilobed at apex; elytra non-striate; anterior tibia with one apical spur; ventrites 1 and 2 fused (New Caledonia) | <i>Bohumiljanina</i> Monrós |
| 5(1) | Upper surface extremely dull from microreticulation, clothed with recumbent scales; pronotum with small lateral teeth, or dorsal tubercles; claws bifid (Australia) | <i>Cheiloxena</i> Baly |
| - | Upper surface shining, almost glabrous, without scale-like setae; disc of pronotum non-tuberculate, but sides frequently with strong angular or rounded projection; claws simple | 6 |
| 6(5) | Elytra with pair of large angular tubercles near scutellum, rugosely and irregularly punctured (Australia) | <i>Richmondia</i> Jacoby |
| - | Elytra smooth, non-tuberculate and non-rugose | 7 |
| 7(6) | Pronotal width at posterior angles greater than width at anterior angles; prosternal process depressed, transverse with bilobed apex (Australia) | <i>Allsortsia</i> gen. nov. |

- Pronotal width at posterior angles less than width at anterior angles; prosternal process arched, elongate, with truncate or pointed apex (Australia and New Guinea)..... *Macrolema* Baly

***Macrolema* Baly 1861**

Type species: *Macrolema vittata* Baly 1861, by original designation and monotypy

= *Macrogonus* Jacoby 1894; Seeno & Wilcox 1982 (synonymy). Type species: *Macrogonus submetallicus* Jacoby, by monotypy

Diagnosis

Length 8–15mm; shape elongate, with strongly narrowed base of pronotum compared with elytral width at humeri; dorsum not distinctly pubescent, but may have scattered minute setae; eyes large, gena c. 0.1–0.4x eye length; pronotum widest at middle, or middle and anterior, and width at posterior angles narrower than width at anterior angles; lateral margination of pronotum absent; prosternal process elongate, arched between coxae, apex truncate or slightly pointed; elytra partially striate, but striae may be obscured by large interstitial punctures; male tibiae straight; tibial spurs 1+2+2, or 0+2+2, or 0+1+1; claw simple, with slight angulation at base of ventral margin; ventrites I and II fused or rarely not entirely fused, with some movement at middle.

Description

Length 8–15mm, females larger than males on average (rarely overlapping); body (Figs 3–16) elongate-ovate, length 2.5–3.0x width, but with prominent elytral humeri and narrow pronotal base, moderately to shallowly convex in profile, length 2.7–3.4x height. Dorsum shining and smooth, coloured metallic green or blue, or plain brown or black, with or without areas of pale yellow or red, glabrous except trichobothria adjacent to eyes and on each corner of pronotum, or with additional short setae on vertex, pronotum and/or elytra.

Head (Figs 19–37): fronto-clypeus smooth, triangular, anterior margin shallowly concave, usually depressed between eyes and without elevated apex; vertex smooth; eyes ovate, height c. 1.5x width, inner margin shallowly concave; eye laterally projecting, posterior curvature contiguous with short temples, which are constricted to parallel-sided head capsule; head capsule generally without deep grooves or ridges, but a few species with deep median groove between eyes; gena 0.1–0.4x greatest eye length; antennae 4–6x socket diameters apart; antennae c. 0.6–0.9x body length; relative sizes of antennomeres variable, but 1 always enlarged cylindrical or widest at apex, 2 shortest (c. 0.5–0.67x first), 3 equal to or shorter than 1, antennomeres 8–11 almost parallel-sided, 7, or 7 and 11, or 5, 7 and 11 longest; antennomeres 1–4 shining and sparsely punctured, 6–11 dull and densely microsculptured, 5 intermediate; labrum not densely setose, with 1–3 pairs of prominent setae; mandible with single apical tooth and two setose membranes (pulvilli) at middle and base of inner margin; apical maxillary palpomere elongate, fusiform to cylindrical, males with broader truncate apex; preapical palpomere triangular, length equal to or shorter than apical, and of similar width; mentum transverse, width c. 4x median length, but anterior angles narrowly produced.

Thorax (Figs 3–16, 37–40, 42–43, 45–59): pronotum transverse, width 1.3–1.85x length, broadest anterior to middle (or anterior angles as well) and slightly to strongly contracted to anterior and posterior angles; disc with or without pair of depressions; anterior edge truncate to concave, posterior convex or medially truncate, lateral margins slightly convex to strongly sinuate or lobed; anterior (at least at sides) and base distinctly margined (except some individuals with border absent at hind angles), lateral margination absent; anterior and posterior angles laterally prominent, with single trichobothria; posterior trichobothria anterior to vertical plane above posterior margin of hypomeron, anterior displacement most pronounced in *M. albascutica*, least so in *M. aenescens*; posterior edge of hypomeron projecting into hollowed base of elytra; prosternum flat and punctate between coxae and head; prosternal process narrow and strongly arched, with slightly pointed or truncate apex; procoxal cavities closed by insertion of hypomeral lobes into prosternal process; scutellum elongate-triangular, apex superimposed on sutural base; elytra broadest at base, with strongly developed humeri, with or without lateral or median depressions; with scutellary striae and up to 9 striae, plus series of large punctures at epipleural margin, striae often obscured; elytral epipleuron narrow, width <0.2x elytral

width, entirely visible laterally, slightly sinuate, gradually contracted from base to apex; mesoventrite entirely visible, well-developed, punctured, with elongate and parallel-sided median process; anterior of mesoventrite process evenly curved or elevated with anteriorly facing ridge; wings fully developed; metaventrite shining, smooth or feebly transversely wrinkled, transverse, width c. 2x length, without femoral plates; metepisternum smooth and shining or weakly microreticulate, with sparse punctures; all femora fusiform, with base and apex narrowed, without longitudinal keels or ridges, all tibiae round in section, without keels, thin, with abruptly expanded apices; short spur on protibia present or absent, 1 (*M. longicornis*) or 2 on remainder; all first tarsomeres with oval patch of modified setae in males, with dense simple setae diverging from midline in females; apex second tarsomere concave; third tarsomere deeply bilobed, lobes at least 0.5x median length; claws simple, without basal tooth.

Abdomen (Figs 61–65, 68–80, 82–95, 97, 99–112, 114–127, 129): pygidium (tergite 7) not strongly sclerotised except at apex, basal half membranous, apical half pubescent and punctured, without median groove; ventrite I with triangular intercoxal process and without femoral plates; ventrites I and II usually completely fused; ventrite V smooth, not medially depressed, and truncate or convex at apex in both sexes, but shorter in male; dense sclerotisation of sternite VIII of male variable, fan-shaped, Y-shaped, or linear; sternite IX of male Y-shaped; male tegmen present, enclosing penis, U-shaped, thinly sclerotised and with slight internal median keel; penis simple, flattened tubular, apex sparsely microspiculate, basal foramen c. 0.4x length of penis; vas deferens with long thickened sperm pump; female tergite VIII well-developed, sternite VIII with transverse to elongate basal apodeme; ovipositor with thin bacillus wrapped around base of paraprocts, which are well-developed, partly enclosing basal half of palpi, pair of well-defined elongate proctigers dorsal to these; vaginal palpi 2-segmented, gonocoxite massive, not divided, gonostylus variable in size and shape; membranous pad between gonocoxites lacking sclerite; spermatheca generally falciform, surface microreticulate, with long spermathecal duct; kotpresse absent, rectum without band of spinules.

Notes

The diagnostic description for Spilopyrinae provided in Reid (2000) needs to be modified to accommodate all species of *Macrolema* as follows: gena 0.1–1.5x eye length; antennomeres 8–11 to 6–11 densely setose and microsculptured; anterior pronotal border complete or effaced at middle; articulated tibial spurs 0+1+1, or 0+2+2, or 1+2+2, or 2+2+2; third tarsomere shallowly or deeply bilobed; kotpresse (faecal plate organ) present or absent.

The synonymy of *Macrolema* and *Macrogonus* Jacoby has been briefly dealt with (Reid 2000), but is explained in full here. *Macrogonus* was defined by possession of lateral lobes on the pronotum (Jacoby 1894). This feature is a grade, at its most extreme in *M. submetallicus* and *M. ventralis*, but with varying degrees of expression in between. Differences in other features such as prothoracic morphology, elytral depressions, male and female genitalia, do not conform with development of the pronotal lobes, therefore the synonymy is justified. However the synonymy was originally based on a misunderstanding by Lea, who confused males and females of a species with lateral lobes (*M. atripennis*) and one without (*M. longicornis*) (Lea 1921a). Curiously, having decided that *Macrogonus* and *Macrolema* could not be distinguished except in males, Lea described *M. ventralis* in *Macrogonus* on the mistaken assumption that the holotype was a female specimen (Lea 1921b). This action has led to considerable confusion in Australian collections, which have been dominated by material identified by Lea.

Sexual dimorphism

Sexual dimorphism is slight. Males are smaller on average, with larger cephalic sensory organs: apical maxillary palpomeres broader, antennae longer, eyes proportionally larger. Males also have first tarsomeres broader and ventrite 5 shorter.

Distribution and biology

Macrolema is confined to Australia and New Guinea; it occurs on the eastern ranges of Australia, from Barrington Tops, New South Wales, in the south, to Cape York Peninsula, Queensland, and the eastern ranges

of New Guinea (Figs 130–134). A number of early Australian specimens appear to have erroneous locality labels as they have come from two poorly curated collections (see under species descriptions). Ignoring these suspect labels, the 11 Australian *Macrolema* species are restricted to only 4 of the 85 recently designated Australian bioregions (Anonymous 2009): Wet Tropics (6 species), Central Mackay Coast (1), Southeast Queensland (3), New South Wales North Coast (2), all of which are dominated by high rainfall forests.

The species are generally rarely collected, although large and conspicuous. Two species have been collected at light (*M. metallica*, *M. quadrivittata*), and two other species (*M. pulchra*, *M. ventralis*) have probably been collected in similar circumstances, as specimens are clothed in lepidopteran scales. Almost all *Macrolema* adult specimens have been collected from October to January and the sex ratio is approximately 1:1. The basic biology of *Macrolema* is unknown and remarkably not even the foodplant is accurately recorded for any species. The absence of a kotpresse may indicate that *Macrolema* species do not coat their eggs in plates of excrement, unlike *Spilopyra* species (Reid 2000). However it does not preclude use of excrement as an egg covering, as this is done by many Eumolpinae which also lack the kotpresse (*pers. obs.*, CAMR).

A first-instar spilopyrine larva collected and described by CAMR (Reid 2000) probably belongs to this genus (Fig. 17). The pale-green larva was collected at the entrance to Red Cedar Flora Reserve, Nymboida-Binderay National Park, New South Wales, the same locality as a specimen of *Macrolema vittata* Baly collected 12 years later by our colleague José Jurado-Rivera. As no other spilopyrines have been collected at this locality, we consider that this larva is almost certainly a specimen of *M. vittata*. Compared with other Spilopyrinae, the larva is characterised by a massive circular terminal plate with a fringe of long setae, an undivided frons and only two pairs of eggburstors, on the meso- and metathorax (Reid 2000). The external morphology is most similar to the larva of *Stenomela* Erichson (Jerez 1995), which is freeliving, feeding on leaves.

There is strong evidence for mimicry between *Macrolema* species and other Chrysomelidae, especially species of *Oides* Weber (Galerucinae). For example, the distribution of the two colour forms of *M. vittata* closely mirrors the distribution of two similar colour forms of *O. fryii* (Clark 1864). *Oides* species are conspicuous and relatively common rainforest beetles, belonging to a subfamily well-known for strong chemical protection (Pasteels, Braekman & Daloze 1988; Pasteels, Rowell-Rahier, Braekman & Daloze 1994). *Macrolema* species are rare and do not appear to be chemically protected and the mimicry would appear to be Batesian (Pasteur 1982).

Two Australian species of *Macrolema* are only known from a small amount of old material and may reasonably be considered ‘Endangered’ in conservation status (International Union for Conservation of Nature 2001): *M. giya* sp. nov., one specimen, last collected before 1919; *M. submetallicus* (Jacoby), eight specimens, last collected 1951. Given the infrequency of collection, it is quite likely that further species await discovery, especially in New Guinea.

Key to species of *Allsortsia* Reid & Beatson and *Macrolema* Baly

- | | | |
|------|--|----|
| 1 | Prosternal process arched, with truncate or slightly medially pointed (<i>M. metallica</i>) apex (Figs 45–57); abdominal ventrites distinctly punctured and pubescent (Figs 61–65); upper margin epipleuron reaching base of elytron (Fig. 42–43) (<i>Macrolema</i>)..... | 2 |
| - | Prosternal process flat, apex bilobed, deeply concave between points (Fig. 44); abdominal ventrites glabrous, or almost so (Fig. 60); upper margin epipleuron not reaching base of elytron (Fig. 41) (elytron red with 6 metallic spots; sides of pronotum triangularly projecting (male) or rounded (female) (12–13mm; NQ; Figs 1–2)..... | |
| | <i>Allsortsia maculata</i> (Lea) | |
| 2(1) | Pronotum with prominent, rounded to triangular, lateral process, projecting well beyond a straight line between apices of tubercles at anterior and posterior angles (Figs 3–5, 7–8, 10, 12–13)..... | 3 |
| - | Pronotum evenly rounded at sides, not or feebly projecting beyond a straight line between apices of tubercles at anterior and posterior angles (Figs 6, 9, 11, 14–16)..... | 10 |
| 3(2) | Mesoventrite process strongly arched, not anteriorly produced (Figs 45, 47, 49); elytra non-striate, or with depressions in basal half (Figs 3, 5, 7); female second abdominal ventrite without dense patch of setae either side of midline | 4 |

- Mesoventrite process abruptly elevated and produced anteriorly (Figs 50, 54); elytra striate, without depressions in basal half (Figs 8, 12); female second abdominal ventrite with dense patch of setae either side of midline (pronotum yellow, sometimes with pair of small dark spots)..... 9
- 4(3) Pronotum evenly reddish-yellow or red, non-metallic (Figs 3, 5, 7–8, 12) (apex of prosternal process downcurved; length 8–12mm; NSW, SQ & CQ)..... 5
- Pronotum reddish-brown or black, at least disc metallic (Figs 4, 10, 13) (length 9.5–15mm; elytral disc with 2 distinct depressions on basal half; NQ & NG)..... 6
- 5(4) Elytra entirely metallic black, striate, with 2 deep dorso-lateral depressions; tibiae red (length 8–12mm; SQ-NNSW; Fig. 5) *M. atripennis* (Bowditch)
- Elytra non-metallic black with pale margins, non-striate, without dorso-lateral depressions; tibial external edges black (11mm; CQ; Fig. 7) *M. giya* sp. nov.
- 6(4) Elytra entirely dark and metallic; pronotal lateral lobes rounded (Figs 4, 10) 7
- Elytra entirely pale reddish-yellow; pronotal lateral lobes triangular (head, pronotum, legs and venter metallic black; apex of prosternal process elevated; 11–13.5mm; NQ; Fig. 13) *M. submetallica* (Jacoby)
- 7(6) Antennae entirely metallic blue or first antennomere partly red (Fig. 10); tibiae dark red, contrasting with paler reddish-brown femora; pronotal disc dark brown and metallic, margins broadly red, non-metallic; ventrites 3–4 without lateral keels (Fig. 61); eyes smaller, separated by 3.5–4.5x eye widths (Fig. 26) 8
- Apical antennal segments white (Fig. 32); femora and tibiae evenly reddish-brown; pronotum evenly dark brown and metallic; ventrites 3–4 with short lateral keels (Fig. 61); eyes large, separated by 2–2.5x eye widths (Fig. 20) (apex prosternal process downcurved; 11–15mm; NQ; Fig. 4) *M. albascutica* sp. nov.
- 8(7) Apex prosternal process downcurved; elytra strongly punctured throughout, slightly rugose (length 15mm; NG; Fig. 3) *M. aenescens* (Bowditch)
- Apex prosternal process elevated (Fig. 52); elytra almost impunctate in apical half, smooth surfaced (fig. 39) (length 9.5–13mm; NQ; Fig. 10)..... *M. metallica* (Lea)
- 9(3) Antennae banded black and yellow (Fig. 35); femora yellow (pronotum usually with pair of small dark spots; elytra usually striped; 8–12mm; NQ; Fig. 12) *M. quadrivittata* (Jacoby)
- Antennae entirely black; femora black (pronotum without spots; elytra entirely black; 12mm; NG; Fig. 8) *M. karimui* sp. nov.
- 10(2) Elytra black, usually with metallic reflection (Figs 9, 14); femora reddish-yellow, with apices and tibiae darkened, usually metallic black; dorsolateral elytral depressions present; protibia without apical spur 11
- Elytra yellow, yellowish- or reddish-brown, usually with dark stripes, spots or blotches (Figs 6, 11, 15–16); dorsolateral elytral depressions absent or weak; protibia with apical spur 12
- 11(10) Antennae more robust, antennomeres 4–6 with thickened apices (Fig. 33); ventrites 2–5 yellow (Fig. 62); mid and hind tibiae with 1 apical spur; midline of male ventrites pubescent (Fig. 62) (8.5–12mm; SQ-NNSW; Fig. 9) *M. longicornis* Jacoby
- Antennae more gracile, antennomeres 4–6 not apically thickened (Fig. 36); ventrites 2–5 black (Fig. 64); mid and hind tibiae with 2 apical spurs; midline of male ventrites glabrous (Fig. 64) (8–11mm; NNSW; Fig. 14) *M. ventralis* Lea
- 12(10) Basal half of elytra yellow with dark patches or spots, contrasting with red or metallic black pronotum (Figs 6, 11); antennae not bicoloured, entirely red to black 13
- Elytra yellow, yellowish- or reddish-brown, with pale yellow margins, and with or without dark stripes (Figs 15–16); antennae bicoloured, ventrally red, dorsally metallic brown to black (tibiae externally metallic; pronotum usually with median stripe) (9–13mm; SQ-NNSW; Figs 15–16) *M. vittata* Baly
- 13(12) Head, antennae, legs and pronotum metallic black; elytra yellow with two small spots in basal half in slight depressions; pronotal disc with deep lateral depressions; midline of male abdomen smooth and impunctate (8–9.5mm; NQ; Fig. 6) *M. dickdaviesi* sp. nov.
- Head, femora and pronotum red, antennae dark red with slight metallic reflection; elytra yellow with interrupted metallic transverse fascia in smooth basal half and large shared metallic patch occupying most of apical half; pronotal disc rarely laterally depressed; midline of male abdomen punctured (8–10.5mm; NQ; Fig. 11) *M. pulchra* sp. nov.

***Macrolema aenescens* (Bowditch 1913)**

(Figs 3, 19, 45, 99, 114, 130)

Macrogonus aenescens Bowditch 1913: 268

Macrolema aenescens: Reid 2000: 862

Material examined

Types: Holotype: female/ Moroka Brit N. G. 3500ft x.[18]95 Anthony/ *Macrogonus aenescens* Bow type/ type 8472/ type F. C. B. coll/ [MCZ].

Description of *Macrolema aenescens* (Bowditch) [female only]

Length 15mm; body relatively convex in profile, length 2.7x height. Body and appendages red, except (i) basal half of head, tips of mandibles, middle of pronotum, elytra except epipleura, tibiae, middle of ventrites dark reddish-brown with weak to strong metallic green reflection, (ii) antennae and tarsomeres 1–3 dark brown with metallic blue reflection. This may be a slightly teneral specimen.

Head (Figs 3, 19): anterior half finely and closely punctured, posterior more sparsely punctured; circular depression between eyes and deep groove on midline of vertex; eyes small, separated by 4.5x eye widths, gena 0.4x eye length; antennae 4x socket diameters apart; antennae c. 0.6x body length; all antennomeres elongate: 2 shortest (c. 0.6x first), <3, <1=4, <5=6=8=9=10, <7=11; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical, preapical palpomere as long as apical.

Thorax (Figs 3, 45): pronotum closely and strongly punctured at sides, base, midline and hypomeron, sparsely on anterior half of disc, shining, with distinct micropunctures between macropunctures; pronotal width 1.8x length, with strongly developed flat lateral lobes at middle; pronotal disc with pair of deep lateral depressions and shallow basal depression; anterior without margination at middle half of edge; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum impunctate, elongate-triangular with blunt apex; elytron with 2–3 irregular rugose depressions on basal half of disc, a small shallow one on stria 4, and a large irregular area (or 2 coalescent) on striae 6–8; elytral punctures large and deep in basal half, much shallower towards apex; elytra partly striate, with striae 1–5 regular and 6–9 partially obliterated by rugose elytral depressions and large interstrial punctures; irregular rugosity along basal half of elytron adjacent to epipleuron; upper margin epipleuron obliterated below humerus, not reaching base of elytron; mesoventrite median process strongly arched to concave apex; metaventrite shining and sparsely punctured, anterior with median depression and no margination at middle, edge pitted lateral to this; metepisternum distinctly microreticulate and sparsely punctured; 1 short apical spur on protibia, 2 on remainder.

Abdomen (Figs 99, 114): ventrites I and II entirely fused; ventrites I–V smooth and shining, not microreticulate, sparsely and finely punctured, more conspicuously so on IV–V; ventrite I laterally keeled along basal half, other ventrites without lateral keels; apex female ventrite V rounded; female sternite VIII with transverse basal apodeme, widest at apex; gonocoxite distinctly setose; spermatheca hook-shaped, with densely coiled duct.

Notes

Macrolema aenescens is known from the single type specimen, collected in 1895 at 1100m, at Moroka in the Owen Stanley Range, near Port Morseby (Fig. 130). The village of Moroka has since been abandoned (Bell 1984).

***Macrolema albascutica* sp. nov.**

(Figs 4, 20, 32, 46, 61, 68, 82, 97, 100, 115, 129, 130)

Material examined

Types: Holotype: male/ Mt Lewis N Qld 7 Dec 1975 A & M Walford-Huggins [ANIC]; Paratypes (5): female, same data as holotype [ANIC]; male/ NEQ 17:16S 145:52E Bellenden Ker summit 8 Oct 1991 1560m Monteith, Janetzki & Cook/ [QMB]; female/ Windsor Tableland, NE Mt Carbine N Qld 2 Sept 1986 A & M Walford-Huggins [AMS]; female/ 26km up Tinaroo Ck Rd via Mareeba N Qld 19.vii–24.viii.1983 Storey & Brown/ Malaise trap/ [QDPIM]; male/ Mt Lewis 750m rainforest 22km SW Mossman NE Qld 7 Jan 1978 Anthony Hiller coll./ [QMB]; male/ Bellenden Ker range, NQ Cable Tower 3, 1054m, Oct 17–24 1981, Earthwatch & Qld Museum/ [QMB].

Description

Length: males 11–12.5mm, females 13–15; body moderately convex in profile, length c. 3x height. Body and appendages dark reddish-brown (one teneral specimen pale reddish-brown) with metallic green reflection, weak ventrally and on legs, except (i) labrum and palpi reddish-yellow; (ii) apices tibiae, tarsi clear red; (iii) antennomeres 8–11 creamy-white to pale yellow; (iv) most of remaining antennomeres, at least 4–7, purplish-blue.

Head (Figs 4, 20, 32): head puncturation variable but frontoclypeus more finely and closely punctured than sparsely and more strongly punctured remainder of head; depressed between eyes, with or without groove on midline of vertex; eyes large and laterally prominent, separated by c. 2x eye widths (male) or c. 2.7x eye widths (female); gena short, c. 0.11x eye length (male), or c. 0.15x eye length (female); antennae c. 4x socket diameters apart; antennae c. 0.75x body length (male), or c. 0.6x body length (female); all antennomeres elongate: 2 shortest (c. 0.5x first), <1=3, <4=8=9=10, <5=6=11, <7 (male), female similar but 7=11; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere as long as apical.

Thorax (Figs 4, 46): pronotal puncturation variable in size and density, sparsely and strongly punctured at sides, base, midline and hypomeron, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.45x length, with strongly developed convex lateral lobes at middle; pronotal disc with pair of deep lateral depressions, with or without shallow basal depression; anterior margination complete; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum impunctate, elongate-triangular with blunt apex; elytron with 2–3 irregularly shaped deep depressions on basal half of disc, one on stria 4, and 2 on striae 6–9; elytral punctures fine and shallow in basal half, evanescent towards apex; elytra partly striate, with striae 1–5 regular and 6–9 partially obliterated by deep elytral depressions, without interstrial punctures; 1–2 deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination and without median depression, edge pitted lateral to middle; metepisternum not microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 61, 68, 82, 97, 100, 115, 129): ventrites I and II entirely fused; ventrites I–V smooth and shining, not microreticulate, moderately closely and strongly punctured on apical half of I–II, and most of III–V, long semi-erect pubescence in transverse apical bands on each ventrite; ventrite I laterally keeled along basal 2/3, other ventrites with short lateral keels, <0.25x ventrite length; apex ventrite V narrowly truncate in both sexes; sternite VIII of male Y-shaped; apex of penis triangular in dorsal view, apical angle c.90°, tip straight and not thickened in lateral view; female sternite VIII with quadrate basal apodeme; gonocoxite without distinct setae; spermatheca falcate, with densely coiled duct.

Notes

Etymology: from Latin *alba* and *scutica*, meaning white-whipped, in reference to the antennae.

The 7 specimens of *Macrolema albascutica* were collected from September to January and July or August (teneral example). All were taken at moderate to high elevation, 750–1560m, in tropical rainforest, north Queensland, from Bellenden Ker to Windsor Tableland (Fig. 130).

Macrolema atripennis (Bowditch)

(Figs 5, 21, 47, 69, 83, 101, 116, 134)

Macrogonus atripennis Bowditch 1913: 268

Macrolema atripennis: Reid 2000: 862

= *Macrogonus bifoveicollis* Lea 1921: 229

Macrolema bifoveicollis: Reid 2000: 862 (synonymy)

Material examined

Types: *Macrogonus atripennis*: Holotype: female/ Richmond R. New S Wales/ *Macrogonus atripennis* Bow Type/ Type F. C. B. Coll./ Type 8473/ [some dermestid damage, with loss of two legs on one side] [MCZ]; *Macrogonus bifoveicollis*: Holotype: female: /male [sic]/ bifoveicollis Lea Type Tambourine/ *Macrogonus bifoveicollis* Lea Queensland Type I.4771/ [SAM]; Paratypes (3): 2 females: /male [sic]/ Tambourine Queensland/ type/ *Macrogonus bifoveicollis* Lea Queensland cotype/ [SAM]; male: /male/ Mt Tambourine Hacker 741/ *Macrogonus bifoveicollis* Lea Queensland cotype/ [QMB].

Non-types (15): *New South Wales*: female: / Mt Warning NP, NSW, ex *Ficus*, [c.550m] 23.xi.1986, C. Reid/ [ANIC]; male: /NSW Mt Warning summit 31.xi.1991, A. Sundholm/ [AMS]; female: /Mt Warning, Up. Tweed R., NSW, 11.i.1923, A. Musgrave/ [AMS]; *Queensland*: female: / Cooktown NQ, H. W. Brown/ [AMS]; male/ Lamington NP, IBISCA 7008, 28.192S 153.124E, malaise RF, 16.xii.2008–6.i.2009, G. Monteith [AMS]; male, 2 females/ [Lamington] National Park, H. Hacker, xii.1919/ [QMB]; male/ Lam.[ington] Nat. Pk, Qld, 17–21.ii.1964, G. Monteith & H. A. Rose/ [UQB]; male: /MacPherson's Range, Deane/ [UQB]; male: /Mt Gannon summit, via West Burleigh, S. E. Qld, rainforest, 18.i.1987, G. Monteith & D. Cook/ [QMB]; female: /Tambourine Mountain, H. Hacker, 28.xii.1911/ [ANIC]; male/ Tambourine Mountain, H. Hacker, 29.xi.1925/ [QMB]; 2 females: / Tamborine Mtn, Qld, B. G. Styles/ [AMS].

Description

Length: males 8–9.5mm, females 10–12mm; body convex in profile, length c. 2.7x height. Body and appendages brownish- or reddish-yellow, except (i) elytra and antennomeres 2–11 black, with dark blue reflection; (ii) tarsi, apices tibiae, dark brown with green reflection; (iii) middle of abdominal ventrites I–IV sometimes brown or black, apices mandibles brown.

Head (Figs 5, 21): head puncturation variable, usually sparse and fine on middle and frontoclypeus, stronger and closer at sides, but may be strongly and closely punctured throughout vertex; depressed between eyes, without deep grooves at sides of depression, with groove on midline of vertex; eyes separated by c. 3.7x eye widths (male) or c. 4x eye widths (female); gena c. 0.4x eye length (both sexes); antennae c. 4x socket diameters apart; antennae c. 0.8–85x body length (male), or c. 0.7x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <3, <1, <4=10, <5=6=8=9=11, <7 (male), female similar; labrum not densely setose, with 2 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in both sexes, preapical palpomere shorter than apical.

Thorax (Figs 5, 47): pronotal puncturation variable in size and density, generally sparse and fine, with larger punctures at base, shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.6x length, with strongly developed convex lateral lobes at middle; pronotal disc with pair of deep lateral depressions, with or without shallow basal depression; anterior margination complete or effaced at midline; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum punctured at sides and base, elongate-triangular with blunt apex; elytron with 2 circular deep depressions on basal half of disc, one on striae 4–5, and one on striae 6–8; elytral punctures strong and deep, finer towards apex; elytra striate, with striae 1–6 regular and 7–9 partially obliterated by deep elytral depressions and large interstitial punctures; 1–2 deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process narrow, strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination and without median depression, edge slightly pitted lateral to middle; metepisternum microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder. Abdomen (Figs 69, 83, 101, 116): ventrites I and II fused (not completely in male: some movement at middle); ventrites I–V smooth and shining, not microreticulate, moderately closely and strongly punctured on apical half of I–II, and most of III–V, males less punctate or impunctate along midline; short recumbent pubescence on each ventrite; ventrite I laterally keeled along basal 1/3–2/3, other ventrites without keels; apex ventrite V narrowly truncate in both sexes; sternite VIII of male Y-shaped; penis slightly mucronate in dorsal view, tip slightly curved and thickened in lateral view; female sternite VIII with elongate-triangular basal apodeme; gonocoxite distinctly setose; spermatheca hook-shaped, with densely coiled duct.

Notes

Macrolema atripennis is known from a few moderately elevated localities at or near the border of New South Wales and Queensland, from Mount Warning to Mount Tamborine (Fig. 134). The specimen from north Queensland is probably mislabelled. Cooktown is far from the nearest locality and the specimen comes from a collection (H. W. Brown) with many problematic labels (*pers. obs.*, CAMR; see also under *M. quadrivittata*). 20 specimens were collected, from November to February. The single specimen collected on *Ficus* was not feeding.

Macrolema dickdaviesi sp. nov.

(Figs 6, 22, 48, 70, 84, 102, 117, 131)

Material examined

Types: Holotype: male: /Mt Fisher, Millaa Millaa, N Qld, 10.xi.1979, A & M Walford-Huggins/ [ANIC]; Paratypes(3): male, same data as holotype [ANIC]; female: /Mt Misery, N Qld, West [sic] of Carbine, 21.xii.1974, A & M Walford-Huggins/ [ANIC]; female: /S Johnstone R., Queensland H. W. Brown/ [AMS].

Description

Length: males 8mm, females 9–9.5mm; body shallowly convex in profile, length c.3.2x height. Body and appendages dark brown to black with metallic reflections, green on body, purplish-blue on antennae, tibiae and tarsi, weaker ventrally, except (i) elytron yellow, with two approximately median circular metallic black spots; (ii) apex labrum, maxilla and labium, parts of coxae and trochanters, reddish-brown, apical palpomeres darker.

Head (Figs 6, 22): head puncturation variable but frontoclypeus more finely and closely punctured than sparsely and more strongly punctured remainder of head; minutely setose on anterior of frontoclypeus and above antennae (one specimen only); depressed between eyes, with or without groove on midline of vertex; eyes separated by c. 3x eye widths (both sexes); gena 0.15x eye length (both sexes); antennae c. 6x socket diameters apart; antennae c. 0.85x body length (male), or c. 0.8x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <1=3, <4, <8=9=10, <5, <6=11, <7 (male), or <1=3=4, <8=9=10, <5=6=11, <7 (female); labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in both sexes, apex narrower in female, preapical palpomere shorter than apical.

Thorax (Figs 6, 48): pronotum closely and strongly punctured at sides, base and midline, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures; minutely setose at sides (one specimen); pronotal width 1.4x length, lateral margins strongly convex but not lobed at middle; pronotal disc with pair of deep lateral depressions, with or without shallow basal depression; anterior margination incomplete, absent from middle half; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum punctate at base, elongate-triangular with blunt apex; elytron with 2 circular shallow or deep depressions on basal half of disc, one on striae 3–5, and one on striae 6–8; elytral punctures large and deep in basal half, evanescent towards apex; elytra striate, with striae 1–7 and 9 regular and 8 partially obliterated by deep elytral depression, without or with minute interstitial punctures; irregular depressions absent or small along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination and without median depression, edge pitted lateral to middle; metepisternum not microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 70, 84, 102, 117): ventrites I and II entirely fused; male ventrites shining, not microreticulate, closely and strongly punctured on apical half of I–II, all of III, more sparsely on IV–V, but middle of at least ventrites I and V smooth and impunctate, setae on I–V short and recumbent, with almost glabrous midline, not in distinct transverse bands; female ventrites as male but more densely punctured, wrinkled at sides and midline with scattered punctures and short recumbent setae; ventrite I laterally keeled

along basal 1/2–2/3, other ventrites without keels; apex ventrite V narrowly truncate in both sexes; sternite VIII of male I-shaped (linear); apex of penis gradually narrowed in dorsal view, apical angle c.80°, thickened but not curved in lateral view; female sternite VIII with short triangular basal apodeme; gonocoxite distinctly setose at apex; spermatheca falcate with blunt apex, duct tightly coiled.

Notes

This species is named for an Australian Museum Eureka Science prize winner (in 2005), Dick Davies, at that time chief executive of the Australian Mineral Industry Research Association.

Macrolema dickdaviesi is known from only 4 specimens taken at 3 localities in the Wet Tropics World heritage Area, north Queensland (Fig. 131). This species was collected in November and December.

***Macrolema giya* sp. nov.**

(Figs 7, 23, 49, 71, 85, 131)

Material examined

Type: Holotype: male: /Bowen Queensland A. Simson/ 2756/ [SAM].

Description [male only]

Length: male 11mm; body moderately convex in profile, length c.3x height. Body and appendages brownish-yellow, except (i) elytra except all margins, dorsal half first and all of other antennomeres, outer edge and apices of tibiae, tarsomeres except edges, apices mandibles, median elongate mark on vertex, black with dark blue reflection.

Head (Figs 7, 23): head closely punctured throughout, more finely and closely on frontoclypeus, more coarsely on remainder; depressed between eyes, with 2 small grooves, and long deep groove on midline of vertex; eyes separated by c. 3.5x eye widths; gena c. 0.22x eye length; antennae c. 5x socket diameters apart; antennae c. 0.75x body length (male); all antennomeres elongate: 2 shortest (c. 0.6x first), <3, <1, <4=5=6=8=9, <7; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical, preapical palpomere slightly shorter than apical.

Thorax (Figs 7, 49): pronotum sparsely and strongly punctured at sides and base, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.45x length, with strongly developed convex lateral lobes at middle; pronotal disc with pair of shallow lateral depressions, with small shallow basal depression; anterior margination incomplete, absent on median third; hypomeron strongly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum impunctate, elongate-triangular with blunt apex; elytron without obvious depressions on basal half of disc; elytral punctures strong throughout, both interstrial and strial, and elytra not obviously striate, with strial punctures in irregular lines; without deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination and without median depression, edge pitted lateral to middle; metepisternum not microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 71, 85): ventrites I and II entirely fused; ventrites I–V smooth and shining, not microreticulate, moderately closely and strongly punctured and pubescent throughout, without obvious setose bands on each ventrite; ventrite I laterally keeled along basal 2/3, other ventrites without lateral keels; apex ventrite V convex; sternite VIII of male Y-shaped; apex of penis mucronate in dorsal view, thickened and recurved in lateral view.

Notes

The species name is from the indigenous language of the people inhabiting the type locality (Horton 1996): a noun in apposition.

Macrolema giya is known from the holotype, collected in the vicinity of Bowen, north Queensland (Fig. 131), before 1919, when A. Simson died (Musgrave 1932). The single specimen is missing antennomeres 10–11 and hind tarsomeres 3–5.

***Macrolema karimui* sp. nov.**

(Figs 8, 24, 50, 103, 118, 131)

Material examined

Type: Holotype: female/ New Guinea Kmu Jul 1975/ H. Ohlmus collector/ Kmu = Karimui 6:30S 144:50E/ [ANIC].

Description [female only]

Length 12mm; body relatively convex in profile, length 2.8x height. Body and appendages black, except (i) labrum and labio-maxilla, a spot adjacent to inner margin of eye, prothorax, mesoventrite, middle of base of metaventrite, trochanters, ventral surface of each femur, spot near apex of inner face of metafemur, reddish-yellow; (ii) maxillary palpi, vague mark at middle of frons, anterior and mid coxae, most of anterior femora, dark red.

Head (Figs 8, 24): frontoclypeus finely and closely punctured, remainder of face almost impunctate, punctures small and sparse; circular depression between eyes and shallow groove on midline of vertex; eyes small, separated by 4x eye widths, gena 0.3x eye length; antennae c. 6x socket diameters apart; antennae c. 0.6x body length; all antennomeres elongate: 2 shortest (c. 0.6x first), <3, <4=5, <1=6=8=9=10, <7=11; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical, preapical palpomere slightly shorter than apical.

Thorax (Figs 8, 50): pronotum almost impunctate, with few large punctures at base and laterally and few micropunctures anteriorly; pronotal width 1.8x length, with strongly developed flat lateral lobes at middle; pronotal disc without obvious lateral depressions but with shallow transverse basal depression; anterior without margination at middle quarter of edge; hypomerion not obviously punctate; prosternal process narrow and strongly arched from base to truncate apex, posterior face depressed; scutellum impunctate, elongate-triangular with blunt apex; elytron without obvious depressions on basal half of disc; elytral punctures large and deep in basal half, much shallower towards apex; elytra striate, with 9 regular striae on disc due to large interstrial punctures forming a line between 7 and 8, most interstrial punctures much smaller than strial punctures; upper margin epipleuron continuous around base of humerus, reaching basal margin of elytron; mesoventrite median process abruptly raised to anteriorly directed convex lobe, apex of process concave; metaventrite shining and sparsely micropunctured, anterior without median depression and without margination at middle, edge pitted lateral to this; metepisternum shining and impunctate; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 103, 118): ventrites I and II entirely fused; ventrites smooth and shining, shallowly microreticulate, sparsely and finely punctured, more conspicuously so at sides and on IV–V; ventrite I laterally keeled along basal 2/3, other ventrites without lateral keels; apex female ventrite V narrowly truncate; female sternite VIII with transverse basal apodeme, widest at apex; gonocoxite distinctly setose at apex; spermatheca falcate, with densely coiled duct.

Notes

The species epithet is derived from the type locality, Karimui, a noun in apposition.

Macrolema karimui is known only from the holotype, collected in the central highlands of New Guinea at approximately 1000m elevation (Fig. 131).

***Macrolema longicornis* Jacoby 1895**

(Figs 9, 25, 33, 38, 51, 62, 72, 86, 104, 119, 133)

Macrolema longicornis Jacoby 1895: 53

Material examined

Types: Lectotype (this designation): *Macrolema longicornis*: male: / N.S. Wales/ *Macrolema longicornis* Jac./ type HT/ lectotype/ Jacoby coll.1909-28a/ Lectotype *Macrolema longicornis* Jac det C. Reid i.1989/ [BMNH]; Paralectotype: male: / N. S. Wales/ paralectotype/ Jacoby coll. 1909-28a/ paralectotype *Macrolema longicornis* Jac det C. Reid i.1989/ [BMNH]; *Macrogonus bifoveicollis*: male: / female[sic]/ Mt Tambourine Hacker 742/ cotype/ [QMB]; female: / female/ Mt Tambourine Q A. M. Lea/ cotype/ [SAM]; 2 females: / female/ Tambourine Queensland/ cotype/ [SAM].

Non-types (25): New South Wales: male: / Mt Warning near Murwillumbah NSW 12 Jan 1976 G. Daniels/ [AMS]; male: / G. G. Burns Mount Warning NSW 13.12.1984/ [ANIC]; female: / Nightcap Rge NSW 10.xii.1976 F. T. Fricke/ ex H. W. Brown coll/ [AMS]; 2 males: / Richmond R NSW/ [MCZ]; Queensland: female: / Bald Mt area 3-4000' via Emu Vale, SE Qld, 16-20.ii.1970, G. B. Monteith/ [UQB]; 2 males, 2 females: / Kuranda NQ 22.3.52 C. Oke/ [MVM]; female/ Lamington NP, Lathey Mem.[orial], 28.188S 153.121E, malaise RF, 23.i-3.ii.2009, G. Monteith & F. Turco/ [AMS]; male, female: / Lam.[ington] Nat. Pk Qld 17-21.i.1964 G. Monteith & H. A. Rose/ [UQB]; 2 males, female: / [Lamington] National Pk, Q, H. Hacker Nov 1920/ [QMB]; female: / Lam[ington] Nat Pk 17 Nov 1955 I C Yeo/ [UQB]; 2 males/ Mt Tambourine, SQ, 26.xii.1951, C. Oke/ [MVM]; male: / Tambourine 21.2.27 H Hacker/ E. Sutton coll, don. Dec. 1964/ [QMB]; male: / Tamb.[ourine] Mtn Qld B. G. Styles/ ex H. W. Brown coll/ [AMS]; male: / Tambourine Mt Qld 27.i.1964 E. B. Tay/ [UQB]; male, female: / Tambourine Mt 15.5.44 Jean Gemmell/ C. G. L. Gooding collection donated to ANIC 1979/ [ANIC]; female: / Tambourine Mountain H. Hacker 28.12.11/ [QMB]; female: / T.[ambourine] Mt/ [QMB].

Description

Length: males 8.5–10.5mm, females 10.5–12mm; body weakly convex in profile, length 3–3.2x height. Body and appendages yellow, except (i) antennomeres 2–11, elytra, apices femora, outer faces (sometimes whole) of fore and mid tibiae, hind tibiae, tarsi, black with metallic dark blue (or green on elytra) reflection; (ii) apices of mandibles and apical maxillary palpomere brown, often also median streak on vertex (rarely expanded to whole of base of vertex), two oblique marks at sides of pronotal disc (rarely additional median and lateral spots). The first antennomere may be entirely metallic black to entirely yellowish-brown.

Head (Figs 9, 25, 33): head puncturation variable but strong and sparse to moderately close on vertex, fine and dense on frontoclypeus; shallowly to deeply depressed between eyes, with deep or shallow groove on midline of vertex; eyes separated by c.3.3x eye widths (male) or c.3.7x eye widths (female); gena c.0.27x eye length (male), or c.0.32x eye length (female); antennae 4–5x socket diameters apart; antennae c. 0.85x body length (male), or c. 0.75–0.80x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <3, <1, <4=8=9=10, <5=6=7=11 (male), female similar but 4=6=8=9=10, <5=7=11; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere fusiform, apex broader in male, preapical palpomere as long as apical.

Thorax (Figs 9, 38, 51): pronotum closely and strongly punctured throughout, but slightly more diffusely and finely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures and glabrous; pronotal width 1.3x length (male) or 1.4x length (female), with shallowly convex lateral margins; anterior trichobothria on laterally projecting angles, pronotum widest at anterior angles and median lateral convexity; pronotal disc without lateral depressions, with or without shallow transverse basal depression; anterior margination complete; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum punctured and pubescent at base, elongate-triangular with blunt apex; elytron with scattered fine pubescence at extreme base and apex, most conspicuous at humerus (often worn off or matted to surface); elytron with 2–3 irregularly shaped distinct depressions on basal half of disc, one on striae 4–5, and 2 on striae 6–9; elytral punctures strong and deep in basal half, finer

towards apex; elytra partly striate, with striae 1–6 regular and 7–9 partially irregular and partly obliterated by elytral depressions, but striae may also be obscured by variable and sometimes similar sized interstitial punctures, especially towards sides and apex; 1–2 deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination, margin raised at middle as a lobe slotting into cavity in apex of mesoventrite process, and without median depression, edge not pitted lateral to middle; metepisternum shallowly microreticulate, punctured; without short spur on protibia, 1 on remainder (both sexes): formula 0+1+1.

Abdomen (Figs 62, 72, 86, 104, 119): ventrites I and II entirely fused; male ventrites shining, shallowly microreticulate at sides, closely and strongly punctured throughout; setae short and recumbent to semierect throughout, not in distinct transverse bands; female ventrites as male but more closely punctured and wrinkled; ventrite I with poorly demarcated keel along basal 1/5–1/3, other ventrites without keels; apex ventrite V narrowly truncate in both sexes; sternite VIII of male Y-shaped; apex penis slightly mucronate in dorsal view, apical angle c.80°, tip strongly curved and pointed in lateral view; female sternite VIII with elongate parallel-sided basal apodeme; gonocoxite distinctly setose; spermatheca falcate, duct not tightly coiled.

Notes

Macrolema longicornis was described from two unsexed specimens collected in New South Wales, “received from Dr Staudinger” (Jacoby 1895: 54), without designation of holotype. There are two male specimens in BMNH from the Jacoby collection, labelled *Macrolema longicornis* by Jacoby, one of which has an old and invalid holotype label. Neither has a label from Staudinger. In the absence of other material, these are assumed to be the specimens used by Jacoby. The specimen with the holotype label is hereby designated lectotype, the other specimen becoming paralectotype.

In describing *Macrolema bifoveicollis* (Lea 1921), the author confused two species, both of which were already described. The holotype is a specimen of *M. atripennis* (q.v.supra) but four paratypes belong to *M. longicornis*, as listed above.

Macrolema longicornis is moderately common (31 specimens examined) in the vicinity of the Queensland- New South Wales border, from Nightcap Range to Mount Tambourine (Fig. 133). The four specimens from Kuranda, which lies in a different biogeographic area, are considered to be mislabelled. The collector of this material was one of many schoolteachers around Australia contacted by Oke to send material to the Museum of Victoria (K. Walker, *pers. com.*), where it was sorted and labelled, which could easily have led to mislabelling. These specimens are identical in structure to the remaining material.

Dark pronotal markings and more extensive darkening of the base of the head and the tibiae occurs on five of the six specimens from Lamington, one of the two from Nightcap Range and the specimen from Richmond River, but there seem to be no other differences between these and the paler specimens, which co-occur. *Macrolema longicornis* was collected from November to March, plus one specimen in May.

***Macrolema metallica* (Lea)**

(Figs 10, 26, 39, 52, 63, 73, 87, 95, 105, 120, 132)

Macragonus [sic] *metallicus* Lea 1922: 282

Macrolema metallica: Reid 2000: 862

Material examined

Types: Holotype: female: /*metallicus* Lea type Queensland/ *Macrogonus metallicus* Lea Queensland type/ [SAM]; paratype: male: /Kuranda N. Queensland G. E. Bryant 15.xi.1909/ cotype/ *Macrogonus metallicus* Lea Queensland cotype/ [BMNH].

Non-types (15): Queensland: male: / Bellenden Mtns N. Queensland/ Jacoby coll 1909-28a/ [BMNH]; female: / Innisfail, L. Froggatt/ [QMB]; female: / NEQ, 17:06S 145:36E, Kauri Ck, Lamb Range, rainfor., 1190m, 27.xi.1998, G. Monteith, P. Bouchard & A. O'Toole 1960/ [QMB]; female: / 17:17S 145:38E Lake Eacham NP, at light, 11.ii.1998, T. Weir/ [ANIC]; male: /Mt Fisher SF, Millaa Millaa, N Qld, 10.xi.1979, A & M Walford-Huggins/ [ANIC]; female: / Mt Lewis N Qld 1.xi.1976, A & M Walford-Huggins/ [ANIC]; male: /Mt Lewis Rd, NQ, 3000', at light, 30.x.1966, E. Britton/ compared with holotype/ [ANIC]; male: /Mt Spec Nat Pk, via Paluma, NQ, 7.xi.1969, T. Weir/ [UQB]; female: /Polly Ck, Garradunga, NQ, 20.xii.1999, J. Hasenpusch/ [AMS]; male: /17:07.0S 145:37.7 E Robson Ck Atherton, canopy light trap, LC-3, 16.i.1996, R. L. Kitching/ [AMS]; 3 males, 2 females: / S Johnstone R., Queensland H. W. Brown/ [AMS]; female: /no locality label S. R. E. Brock collection, donated to ANIC 1987/ [ANIC].

Description

Length: males 9.5–11mm, females 11–13mm; body moderately convex in profile, length c.3x height. Body and appendages yellowish-brown except (i) labrum yellow; (ii) disc of pronotum, elytra except epipleural margins, tarsi, dark brown with metallic green reflection; (iii) tibiae (with or without metallic reflection) and first antennomere dark red; (iv) antennomeres 2–11 black with purplish-blue reflection.

Head (Figs 10, 26): head puncturation variable, frontoclypeus finely and sparsely to closely punctured, vague band of stronger punctures between eyes, vertex mostly sparsely punctured; depressed between eyes, with two deep grooves, groove on midline of vertex absent, shallow or deep; eyes separated by c.3.5x eye widths (male) or c.4.5x eye widths (female); gena c.0.30–0.35x eye lengths (both sexes); antennae c.4.5x socket diameters apart; antennae c. 0.75x body length (male), or c. 0.6x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <1=3=4, <5, <6=8=9=10, <7=11 (male), female similar but 5=6=8=9=10; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere as long as apical.

Thorax (Figs 10, 39, 52): pronotal puncturation variable in size and density, sparsely and strongly punctured at sides, base, midline and hypomeron, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.6x length, with strongly developed convex lateral lobes at middle; pronotal disc with pair of deep, but often small in diameter, lateral depressions, with or without shallow basal depression; anterior margination complete or effaced only at midline; hypomeron strongly punctate; prosternal process narrow and strongly arched from base to elevated and slightly triangular apex; scutellum impunctate, elongate-triangular with blunt apex; elytron with 2–3 irregularly shaped deep depressions on basal half of disc, one on striae 4–5, and 2 on striae 6–9; elytral punctures fine and shallow in basal half, evanescent towards apex; elytra partly striate, with striae 1–5 regular and 6–9 partially obliterated by deep elytral depressions, with minute interstitial punctures; 1–2 deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with median depression and interrupted margination, edge pitted lateral to middle; metepisternum microreticulate, finely punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 63, 73, 87, 95, 105, 120): ventrites I and II entirely fused; ventrites I–V smooth and shining, not microreticulate, finely and sparsely punctured and pubescent throughout, setae not in distinct bands; ventrite I laterally keeled along basal $\frac{1}{2}$ – $\frac{2}{3}$, second ventrite with minute basal keel, ventrites III–V without keels; apex ventrite V shallowly convex in both sexes; sternite VIII of male Y-shaped; apex penis shallowly concave in dorsal view, tip straight and acute in lateral view; female sternite VIII with elongate basal apodeme, expanded to apex; gonocoxite distinctly setose; spermatheca falcate, with densely coiled duct.

Notes

Lea misidentified the sex of the holotype as a male.

Macrolema metallica is a widespread species in the rainforests of north Queensland, from Innisfail to Mount Lewis, 120km north (Fig. 132). Found at all elevations from 10–1190m. 17 specimens have been collected, from October to February, but mostly in November. This species has been collected at light.

The single unlabelled female from the Brock collection lacks antennae and palpi. It differs from all other material of *M. metallica* by: purplish-red reflection on elytra and pronotum, tibiae almost black, eyes closer, pronotal lateral lobes smaller, elytral punctures finer. We prefer to treat this as an unusual specimen of *M. metallica*, pending further material.

***Macrolema pulchra* sp. nov.**

(Figs 11, 27, 34, 53, 74, 88, 106, 121, 134)

Material examined

Types: Holotype: male/ Mt Fisher, Millaa Millaa, N Qld, 10.xi.1979, A & M Walford-Huggins/ [ANIC]; Paratypes (12): 3 males, 1 female, same date as holotype [ANIC]; 2 males, 1 female: /17:26:58S 145:28:27E, Atherton Tableland Qld, Mt Hypipamee Nat. Pk, 18–28.xi.1998, Yee, Edwards, Calder, Halliday & Sutrisno/ [ANIC]; male: /17mi S Atherton, Q, 3000ft, 19.iii.1964, I. F. B. Common & M. S. Upton/ [ANIC]; male, female: /Ringrose [= Crater] Nat Pk, via Atherton N Qld, 9.xii.1966, B. Cantrell/ [UQB]; male: /The Crater, near Herberton, N Qld, 12.xii.1974/ collr A & M Walford-Huggins/ not in SAM/ [ANIC]; female: /Windsor Tableland, NE Mt Carbine, N Qld, 27.xii.1976, A & M Walford-Huggins/ [ANIC].

Description

Length: males 8–9mm, females 9.5–10.5mm; body shallowly convex in profile, length c.3x height. Body and appendages brownish-red (parts of venter may be relatively paler), except (i) antennomeres 1–7, irregularly shaped macula in basal half of each elytron, common circular spot occupying most of apical half of elytra, and apices femora, outer edges and apices of tibiae, tarsi, dark brown with metallic blue or bluish-purple or purple (usually elytral spots) reflection; (ii) remainder of elytra yellow; (ii) apices mandibles, antennomeres 8–11, dark brown or purplish-brown.

Head (Figs 11, 27, 34): head puncturation variable, relatively densely punctured on frontoclypeus and base of vertex, more finely and sparsely punctured on remainder of head; minutely setose above antennae; depressed between eyes, with or without groove on midline of vertex; eyes separated by c.3x eye widths (male) or c.3.5x eye widths (female); gena c.0.3x eye length (both sexes); antennae c.5.5x socket diameters apart; antennae c. 0.85–0.9x body length (male), or c. 0.75x body length (female); antennomeres 1, 3–11 elongate, 2 quadrate: 2 shortest (c.0.5x first), <1=3, <4=5, <6=8=9=10=11, <7 (male), or <1=3=4, <8=9=10=11, <6, <5, <7 (female); labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in both sexes, apex narrower in female, preapical palpomere shorter than apical.

Thorax (Figs 11, 53): pronotum closely and strongly punctured at sides, base and midline, more diffusely elsewhere, shining, with distinct micropunctures between macropunctures; minutely setose at sides; pronotal width 1.4x length, lateral margins strongly convex but not lobed at middle; lateral depression of pronotal disc absent, shallow or small and deep; anterior margination incomplete, absent from middle half; hypomeron punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum punctured at base, elongate-triangular with blunt apex; elytron without depressions on basal half of disc, or trace of one behind humeri; elytral punctures large and deep in basal half, evanescent towards apex; elytra striate, with striae 1–7 and 9 regular and 8 partially obliterated by deep elytral depression, without or with minute interstitial punctures; irregular depressions absent or small along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination and without median depression, edge pitted lateral to middle; metepisternum microreticulate, weakly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 74, 88, 106, 121): ventrites I and II entirely fused; male ventrites shining, not microreticulate, closely and finely punctured on apical half of I–II, most of III–V, setae on I–V largely short and recumbent, in distinct transverse bands; female ventrites as male, but punctures denser, present throughout all ventrites, with slight wrinkling at sides; ventrite I laterally keeled along basal 1/2–2/3, other

ventrites without keels; apex ventrite V rounded in both sexes; sternite VIII of male Y-shaped; apex of penis slightly mucronate in dorsal view, apical angle c.90°, pointed and slightly curved in lateral view; female sternite VIII with short transverse basal apodeme; gonocoxite distinctly setose; spermatheca hook-shaped with blunt apex, duct tightly coiled.

Notes

Named *pulchra* (Latin: beautiful), for what we consider the prettiest species of the genus.

11 specimens of *Macrolema pulchra* have been collected at 3 localities (note that 17 miles south of Atherton, The Crater, Mt Hypipamee and Ringrose all refer to the same place!) in the tropical rainforests of north Queensland, from Mount Fisher to Windsor Tableland, 140km north (Fig. 134), at high elevation (950–1350m). Windsor Tableland is an isolated montane forest, but although the single specimen is slightly differently coloured (the posterior elytral patch is truncate at the base instead of pointed and the pronotal disc is darkened) it agrees with the other material in puncturation, pubescence, shape and size and we therefore consider it to belong to the same species. *Macrolema pulchra* has been collected in November, December and March. Two specimens are covered in lepidopteran scales and were probably collected in light traps.

Macrolema quadrivittata (Jacoby)

(Figs 12, 28, 35, 42, 54, 58, 75, 89, 107, 122, 133)

Macrogonus quadrivittatus Jacoby 1898: 352

Macrolema quadrivittata: Reid 2000: 862

Material examined

Types: Lectotype (this designation): male: / Queensld./ *Macrogonus 4-vittatus*/ BM 1909-28a/ type HT/ lectotype/ lectotype *Macrogonus 4-vittatus* Jac. det C. Reid i.1991/ [BMNH]; paralectotype: male: / Queensld./ *Macrogonus 4-vittatus*; BM 1909-28a/ paralectotype/ paralectotype *Macrogonus 4-vittatus* det C. Reid i.1991/ [BMNH].

Non-types (28): Queensland: 10 males, 2 females: / Cairns dist., A. M. Lea/ *Macrogonus quadrivittatus* Jac., Queensland/ [SAM]; female: /Cairns NQ/ [SAM]; male: / Cairns NQ 1920/ [QMB]; female: / Kirrama Range, NEQ, Douglas Ck Rd, 800m, 9–12.xii.1986, Monteith, Thompson, Hamlet/ [QMB]; female: / Kirrama Range NEQ, Mount Hosie, 800–930m, 10.xii.1986, monteith, Thompson, Hamlet/ [QMB]; female: / L.[ower] Mulgrave R, Q, H. W. B., 17.iv.[year missing]/ Griffith collection, Id. by A. M. Lea/ [SAM]; female: / 17:37S 145:34E Qld, Massey Ck, 1000m, BS3, malaise trap, 3.i–4.ii.1995, P. Zborowski/ [ANIC]; female: / Mt Bellenden Ker summit, via Cairns Qld, 5,200', light trap, 10–18.i.1977, R. I. Storey/ [QDPIM]; male: / Bellenden Mtns N. Queensld/ Jacoby coll 1909-28a/ [BMNH]; male: / Mt Lewis, 8mi NW Mt Molloy Q, 2700ft, 15.iii.1964, I. F. B. Common & M. S. Upton/ [ANIC]; female: / Rockhampton Q H. W. Brown/ [AMS]; female: / Rollingstone, 1946/ S. R. E. Brock collection, donated to ANIC 1987/ [ANIC]; 3 males, 1 female: / S. Johnston R., Queensland, H. W. Brown/ [AMS, SAM]; 2 males: / Upper Mulgrave River, N Qld, 1–3.xii.1965, G. Monteith/ [UQB].

Description

Length: males 8–9mm, females 9.5–12mm; body convex in profile, length c.2.7x height. Body and appendages yellow, except unmetallic black or dark brown on: apices mandibles, most of antennomere 1 and apical ½ to apical 4/5 of segments from base to apex of antenna, vertex except midline, two spots on pronotal disc (may be absent), two broad stripes on each elytron from base almost to apex (in some males coalescent to whole elytron except margins; in some females thinner medially), apices of femora, spot on posterior of postfemur (sometimes absent), apices of tibiae and outer face of protibia, tarsi except bases of tarsomeres, sides of ventrites I–III.

Head (Figs 12, 28, 35): head puncturation variable, frontoclypeus finely and sparsely punctured or more strongly and closely punctured compared with almost sparsely punctured vertex; depressed between eyes, with shallow groove on midline of vertex; eyes separated by c.3.5x eye widths (male) or c.4.4x eye widths

(female); gena c.0.24–0.26x eye length; antennae c.4x socket diameters apart; antennae c. 0.9x body length (male), or c. 0.6x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <3, <1=4, <5=6=8=9=10, <11, <7 (male), female similar but 4=5=6=8=9=10=11, <7; labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere shorter than apical.

Thorax (Figs 12, 42, 54, 58): pronotal puncturation variable, from close to sparse, with scattered large punctures, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.70–1.85x length, with strongly developed convex lateral lobes at middle; pronotal disc with pair of deep or shallow lateral depressions, or these absent, and without shallow basal depression; anterior margination absent from middle third; hypomeron impunctate; prosternal process narrow and strongly arched from base to truncate apex, posterior face concave; scutellum impunctate, elongate-triangular with blunt apex; elytron without depressions on basal half of disc; elytral punctures fine and shallow in basal half, evanescent towards apex; elytra striate, with striae 1–9 regular, interstitial punctures minute; without depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining, sparsely and minutely punctured, anterior without median depression and with incomplete margination, edge pitted lateral to middle; metepisternum not microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 58, 75, 89, 107, 122): ventrites I and II entirely fused; male ventrites shining, not microreticulate, fairly closely and strongly punctured at sides, almost impunctate at middle, especially ventrites III–V, setae on I–V generally short and recumbent, not in distinct transverse bands and absent from midline; female ventrites I and V as male, II–IV microreticulate at sides and II with dense patch of fine punctures and recumbent setae each side of midline; ventrite I laterally keeled along basal 3/4, other ventrites without lateral keels; apex ventrite V broadly truncate in male, narrowly truncate in female; sternite VIII of male, membranous, broadly Y-shaped; apex of penis strongly mucronate in dorsal view, tip straight and blunt in lateral view; female sternite VIII with triangular basal apodeme, widest at apex; gonocoxite without obvious setae; spermatheca falcate, with densely coiled duct.

Notes

Macrogonus quadrivittatus was described from two unsexed specimens from Queensland (Jacoby 1898: 352). There are three specimens from the Jacoby collection in BMNH. Two are labelled ‘Queensld.’, including one with an invalid holotype label, while the third is labelled ‘Bellenden Mtns N. Queensld.’ in Jacoby’s hand. The first two specimens are considered to be syntypes and the one with the holotype label is hereby designated lectotype, the other becoming a paralectotype. The third specimen is not a type.

Macrolema quadrivittata is a relatively common species in the Wet Tropics World heritage Area, from Kirrama Range north to Mount Lewis (Fig. 133), at a broad range of elevations (c.20–1600m). The specimen from central Queensland is probably mislabelled, as Rockhampton is far from the nearest locality and the specimen comes from a collection (ex H. W. Brown) with many problematic labels (*pers. obs.*, CAMR; see also under *M. vittata*). The 30 specimens were collected in December, January, March and April. This species has been collected at light.

***Macrolema submetallica* (Jacoby)**

(Figs 13, 29, 55, 76, 90, 108, 123, 134)

Macrogonus submetallicus Jacoby 1894: 330

Macrolema submetallica: Reid 2000: 862

Material examined

Type: Holotype: female: / Queensland (Meek) / Tring coll. Type F. C. B. Coll./ type 8471/ *Macrogonus submetallicus* Jac./ [MCZ].

Non-types (7): Queensland: female: /Coen NQ 24.v.1951 C. Oke/ [MVM]; female: / Mareeba 2.i.1939 J. G. Brooks/ J. G. Brooks bequest 1976/ [ANIC]; 3 males, 2 females: /S Johnstone R., Queensland H. W. Brown/ [AMS].

Description

Length: males 11–12mm, females 12.5–13.5mm; body convex in profile, length c.2.8–3.0x height. Body and appendages black or blackish-brown with faint metallic purplish-blue reflection, except (i) labrum, palpi and elytra reddish-yellow; (ii) anterior angles pronotum, prosternal process, hypomer processes, anterior face mid coxae, edges abdominal ventrites, reddish-brown; (iii) vaguely indicated parts of head, and scutellum dark brown.

Head (Figs 13, 29): head puncturation variable but frontoclypeus more finely and closely punctured than sparsely and more strongly punctured area between eyes, middle of vertex almost impunctate; depressed between eyes, with two deep grooves at sides of depression, with or without groove on midline of vertex; eyes separated by c.3.6x eye widths (male) or c.4.5x eye widths (female); gena c.0.22–0.24x eye length; antennae c.5.5x socket diameters apart; antennae c. 0.75x body length (male), or c. 0.6x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <3, <1=4, <5=6=8=9=10, <7=11 (male and female); labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere shorter than apical.

Thorax (Figs 13, 55): pronotal puncturation variable in size and density, generally with sparse large punctures laterally and at base, sparser on disc; pronotum shining, with scattered distinct micropunctures between macropunctures; pronotal width 1.7x length, with strongly developed angular lateral lobes at middle; pronotal disc with pair of deep lateral depressions, with or without shallow basal depression; anterior margination complete; hypomer at least partly punctate; prosternal process narrow and strongly arched to raised slightly convex apex; scutellum impunctate, elongate-triangular with blunt apex; elytron with 3 irregularly shaped shallow depressions on basal half of disc, one on striae 4–5, and 2 on striae 6–9; elytral punctures fine and shallow in basal half, evanescent towards apex, interstitial punctures much smaller than striae; elytra partly striate, with striae 1–5 regular and 6–9 partially obliterated by elytral depressions; 1–2 irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventricle shining and sparsely and minutely punctured, anterior with median depression and incomplete margination, edge pitted lateral to middle; metepisternum microreticulate, strongly punctured; 1 short spur on protibia, 2 on remainder.

Abdomen (Figs 76, 90, 108, 123): ventrites I and II entirely fused; ventrites I–V smooth and shining, not microreticulate, sparsely and finely punctured on apical half of I–II, and most of III–V, sparse pubescence not in distinct transverse apical bands on each ventrite; ventrite I laterally keeled along basal $\frac{1}{2}$ – $\frac{3}{4}$, other ventrites without lateral keels; apex ventrite V rounded in both sexes; sternite VIII of male Y-shaped; apex of penis broadly truncate in dorsal view, tip acute and slightly curved in lateral view; female sternite VIII with short basal apodeme, expanded to apex; gonocoxite distinctly setose; spermatheca hook-shaped, with densely coiled duct.

Notes

The 8 specimens of *Macrolema submetallica* examined were collected from 3 localities in north Queensland (Fig. 134), most recently in 1951. *Macrolema submetallica* may reasonably be considered ‘Endangered’ in conservation status (International Union for Conservation of Nature 2001), given its rarity, large size and restricted distribution.

Two of the three detailed localities are on the Atherton Tableland; the third, Coen, is therefore an unlikely location. It is in a biogeographically distinct region, 450km north of Mareeba and South Johnstone River. The collector of this specimen was one of many schoolteachers around Australia contacted by Oke to send material to the Museum of Victoria (K. Walker, pers. com.). Oke then labelled or relabelled the material in Melbourne, which could easily have led to error. The month of collection for this specimen is also unusual. The specimen is identical to the other female material. We therefore consider it mislabelled.

***Macrolema ventralis* (Lea)**

(Figs 14, 30, 36, 56, 64, 77, 91, 109, 124, 133)

Macrogonus ventralis Lea 1921b: 361

Macrolema ventralis: Reid 2000: 862

Material examined

Types: Holotype: male: / *ventralis* Lea Type Comboyne/ 18039 *Macrogonus ventralis* Lea N. S. Wales type/ [SAM].

Non-types: New South Wales: female: / vic Jeep trail, Banda Banda Loop Trail, Banda Banda Beech Resort[sic = Reserve], Mt Boss SF, 14 Jan 1988, G & B Williams, ex rainforest foliage/ [ANIC]; male: / Dorriggo Nat Pk, 11.xi.1961, C. W. Frazier / ANIC Uni of New England coll. donated 1983/ [ANIC]; female: / Dorriggo Nat Pk, NSW, Nov 1982, M. Lowman, rainforest/ No 61/ [ANIC]; male, 2 females: /Dorriggo NSW W. Heron / [ANIC]; male: /Dorriggo / [SAM]; female: /Mt Allyn, Barrington Tops via Salisbury, 8.i.1967, N. S. W., G. Monteith/ [UQB]; male, female: /Mt Moombil, Dorriggo NP, 30:19S 152:51E, GPS #215, 56J0486554-6643990, 1030m, 15.xi.2005, J. Jurado/ [AMS]; female: /New England NP Robinsons Knob firetrail, 30:30S 152:23E, GPS#224, 56J0441352-6625338, 1335m, 18.xi.2005, J. Jurado/ [AMS]; male: New England NP NSW Nov 1980 M. Lowman/ ex leaves *Nothofagus moorei*/ [ANIC]; 2 males: /Pt Lookout via Ebor NSW *Nothofagus* forest 4500' 22.i.1967 B. Cantrell/ [UQB]; male, female: / c.90km NW Wauchope [Mount Banda Banda] NSW 18 Nov 1987 G. Williams ex rainforest margin/ [ANIC].

Description

Length: males 8–9mm, females 9–11mm; body relatively elongate, weakly convex in profile, length c.3.4x height. Body and appendages brownish-yellow, except (i) apices of mandibles, apical palpomeres, head from between antennae to behind eyes (rarely absent), midline and lateral margins pronotum (usually connecting anteriorly; rarely absent, rarely almost entire dorsal surface), scutellum, elytra, apices femora, outer faces fore and middle tibiae, apical third or less of hind tibiae, tarsi, apical third or more of male ventrite I, apical margin female ventrite I, ventrites II–V (apical margins often pale), dark brown to black, with metallic green reflection (elytra and tarsi rarely blue or purple); (ii) antennomeres black with purplish-blue reflection, or antennomere 1 dark green, remainder purplish-blue.

Head (Figs 14, 30, 36): head puncturation variable but strong and moderately close throughout dorsal surface, dense on frontoclypeus; patch of setae present, dorsal to antennae, shallowly to deeply depressed between eyes, with or without groove on midline of vertex; eyes separated by c.3x eye widths (male) or c.4x eye widths (female); gena short, c.0.2x eye length (male), or c.0.3x eye length (female); antennae 5–6x socket diameters apart; antennae c. 0.85x body length (male), or c. 0.70–0.75x body length (female); all antennomeres elongate: 2 shortest (c.0.6x first), <1=3, <4=6=8=9=10, <5=7=11 (both sexes); labrum not densely setose, with 2–3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere as long as apical.

Thorax (Figs 14, 56): pronotum closely and strongly punctured throughout, but slightly more diffusely and finely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures and scattered fine pubescence at sides (often worn off); pronotal width 1.3x length (male) or 1.4x length (female), with shallowly convex lateral margins; pronotal disc with or without shallow lateral depressions, with shallow transverse basal depression; anterior margination complete; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex; scutellum impunctate, elongate-triangular with blunt apex; elytron with scattered fine pubescence, most conspicuous around humerus and at apex (often worn off or matted to surface); elytron with 2–3 irregularly shaped distinct depressions on basal half of disc, one on striae 4–5, and 2 on striae 6–9; elytral punctures fine and shallow in basal half, finer towards apex; elytra partly striate, with striae 1–4 regular and 5–9 partially irregular and partly obliterated by elytral depressions, but striae also obscured by similar sized interstrial punctures, especially towards sides and apex; 1–2 deep irregular depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, but not continued on basal edge; mesoventrite median process strongly

arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior with complete margination, margin raised at middle as a lobe slotting into cavity in apex of mesoventrite process, and without median depression, edge not pitted lateral to middle; metepisternum shallowly microreticulate, punctured; without short spur on protibia, 2 on remainder: spur formula 0+2+2.

Abdomen (Figs 64, 77, 91, 109, 124): ventrites I and II entirely fused; male ventrites shining, not microreticulate, closely and strongly punctured and slightly wrinkled at sides, smooth and impunctate at middle, setae on I–IV short and recumbent at sides, semierect beside broadly glabrous midline, not in distinct transverse bands; female ventrites as male but more closely punctured and wrinkled, and midline often with scattered punctures and short recumbent setae; ventrite I laterally keeled along basal 1/3–2/3, other ventrites without keels; apex ventrite V narrowly truncate in both sexes; sternite VIII of male Y-shaped; apex penis narrowly truncate in dorsal view, tip sharp and strongly curved in lateral view; female sternite VIII with elongate parallel-sided basal apodeme; gonocoxite distinctly setose; spermatheca hook-shaped, duct not tightly coiled.

Notes

Lea (1921b: 361) erroneously described the holotype as female and surprisingly placed the species in *Macrogonus*, although it lacked the definitive lateral pronotal tubercles. This was based on similarity of the ‘female’ *M. ventralis* with the ‘female’ *Macrogonus bifoveicollis*, a misidentification of *Macrolema longicornis* Jacoby (see above). This confusing situation is rendered obsolete by the synonymy of *Macrolema* and *Macrogonus*.

Macrolema ventralis is a relatively common species of Barrington Tops, Mount Banda Banda and the Dorrigo plateau, New South Wales, at high elevation (1000–1300 metres) and is the southernmost species of *Macrolema* (Fig. 133). The 17 specimens were collected in November and January. Three specimens are covered in lepidopteran scales and were probably collected in light traps. This species has been collected on *Nothofagus* leaves, but although *Nothofagus moorei* occurs at all of the localities, there is no evidence of feeding on this plant.

***Macrolema vittata* Baly**

(Figs 15–17, 31, 37, 40, 43, 57, 59, 65, 78–80, 92–94, 110–112, 125–127, 132)

Macrolema vittata Baly 1861: 275

= *Macrolema marginata* Jacoby 1898: 350; **syn. nov.**

Material examined

Types: *Macrolema vittata*: Lectotype (this designation): male: / *Macrolema vittata* Baly Dawsons River [23:38S 149:56E] coll Diggles Stevens/ M. B. [Moreton Bay]/ type/ type/ lectotype/ lectotype *Macrolema vittata* Baly det C. Reid i.1991/ [BMNH]; paralectotype: female: /M. B. [Moreton Bay]/ Baly coll/ paralectotype/ paralectotype *Macrolema vittata* Baly det C. Reid i.1991/ [BMNH]; *Macrolema marginata*: Holotype: male: / Queensld./ *Macrolema marginata* Jac./ Jacoby coll. 1909-28a/ type HT/ holotype/ holotype *Macrolema marginata* Jac. det C. Reid i.1991/ [BMNH].

Non-types (42): *striped colour form* (‘*vittata* s. str.’): male: / Austr. 77.32/ *Macrolema vittata* Baly Australia/ [BMNH]; New South Wales: female: / 6110 Ballina/ *vittata* Baly/ [SAM]; female: / NSW Red Cedar Flora Res, GPS#279 30:11S 152:42E, 56J0470810-6661332 630m 15.xii.2005 J. Jurado/ [AMS]; Queensland: female: /Canungra Ck, 4 mi S Canungra, Qld, xi.1971, G. Monteith/ [UQB]; female: / [Lamington] National Park Q H. Hacker, xii.1923/ [SAM]; female: / [Lamington] National Park Q H. Hacker, xii.1919/ [QMB]; 3 males, 1 female: / Mt Tambourine Q A. M. Lea/ [SAM]; male: / Rockhampt. Austral./ Jacoby 2nd coll./ [MCZ]; 2 males, 1 female: / Sth Johnstone, NQ, H. W. Brown/ [AMS]; male, female: / T.Mt. [Tambourine Mountain]/ *Macrolema vittata* Baly Queensland/ [QMB]; male: / Tambourine Mountain H. Hacker, xii.1923/ [SAM]; 2 males, 1 female: / Tambourine Mountain H. Hacker, 29.xi.1925/ [QMB]; female: / Mount Tambourine Queensland/ E. Sutton coll., don. Dec. 1964/ [QMB]; male, female: / Tambourine

Mountain, H. Hacker/ E. Sutton coll., don. Dec. 1964/ [QMB]; female: / Tambourine Mountain H. Hacker, 28.xii.1911/ [QMB]; female: / QLD Tamborine NP, Palm Grove section, Curtis Rd entrance, 8.xii.2007 C. Reid beating rf veg/ [AMS]; 2 males, 4 females: / Tamborine Mtn Queensland/ [AMS]; *plain colour form* ('marginata'): New South Wales: female: / N. S. Wales/ Jacoby coll. 1909-28a/ [BMNH]; female: / Dorrigo, NSW W. Heron/ [AMS]; male, unsexed specimen: / NSW Norman Jolly FR GPS#275 30:13S 152:41E 730m 56J0468918-6657262 15.xii.2005 J. Jurado/ [AMS]; male: / 32:20S 152:19E, O'Sullivan's Gap, 10km NNE Buladelah, NSW, 15.xi.1976, I.F.B. Common, E. D. Edwards/ [ANIC]; female/ Richmond R New S Wales/ [MCZ]; Queensland: female: / Cape York/ 1st Jacoby coll./ [MCZ]; 2 males, 2 females: / Maleny, 12.i.1927, H. Hacker/ [QMB]; female: / SEQ, 26:38S 152:51E, Mapleton Falls NP, 500m, Rf intercept, 30.xi.1991–8.i.1992, D. J. Cook/ [QMB].

Description

Length: males 9–11.5mm, females 10.5–13mm; body convex in profile, length c.2.8x height. Two colour forms exist, differing by presence or absence of elytral vittae. Body and appendages brownish-yellow or reddish-brown, except: (i) apices of mandibles, median streak on vertex, median line of pronotum and small spot near each anterior angle, two long vittae on each elytron (absent in pale colour form), each c.0.25x elytral width, from base almost to apex, where they fuse, dark brown; (ii) dorsal surface of antennomeres 1–7, dorsal streak at apices of femora, outer faces tibiae, middle of tarsomeres 1, 2 and 5, dark brown to black, with metallic purplish-blue reflection; (iii) antennomeres 8–11 purplish-red; (iv) elytral margins pale yellow.

Head (Figs 15–16, 31, 37): head puncturation variable, strong and close or sparse throughout dorsal surface, finer and generally denser on frontoclypeus; patch of minute setae present, dorsal to antennae; shallowly to deeply depressed between eyes, with or without groove on midline of vertex; eyes separated by c.3.75x eye widths (male) or c.4x eye widths (female); gena c.0.3x eye length (male), or c.0.37x eye length (female); antennae 4–4.5x socket diameters apart; antennae c. 0.85–0.9x body length (male), or c. 0.65–0.70x body length (female); all antennomeres elongate: 2 shortest (c.0.5x first), <3, <1, <4, <5=6=8=9=10, <7=11 (male), female similar except 1=4; labrum not densely setose, with 3 pairs of prominent setae; apical maxillary palpomere elongate, almost cylindrical in male, more fusiform in female, preapical palpomere slightly shorter than apical.

Thorax (Figs 15–16, 40, 43, 57, 59): pronotum strongly and sparsely to closely punctured throughout, more diffusely on anterior half of disc, shining, with scattered distinct micropunctures between macropunctures and scattered fine pubescence at sides (often worn off); pronotal width 1.4x length (male) or 1.5x length (female), with strongly convex lateral margins; pronotal disc with deep lateral depressions, with or without shallow circular basal depression; anterior margination incomplete, absent from midline to middle third; hypomeron at least partly punctate; prosternal process narrow and strongly arched from base to truncate apex, with concave outer face; scutellum punctured and pubescent, at least at base, elongate-triangular with blunt apex; elytron with scattered minute pubescence at base of epipleuron (often worn off or matted to surface); elytron without depressions on basal half of disc; elytral punctures strong and deep in basal half, finer towards apex; elytra partly striate, with striae 1–4 regular and 5–9 partially irregular, all obscured by similar sized interstitial punctures, especially towards sides and apex; without depressions along basal half of elytron adjacent to epipleuron; upper margin epipleuron reaching base of elytron, and continued on basal edge; mesoventrite median process strongly arched to truncate apex; metaventrite shining and sparsely and minutely punctured, anterior flat, without complete margination, with median depression, edge pitted lateral to middle; metepisternum shallowly microreticulate, strongly punctured; with short spur on protibia, 2 on remainder.

Abdomen (Figs 65, 78–80, 92–94, 110–112, 125–127): ventrites I and II entirely fused; male ventrites shining, not microreticulate, moderately closely and strongly punctured, closer at sides, impunctate at middle of base of V, setae on I–IV generally recumbent, not in distinct transverse bands; female ventrites densely punctured and wrinkled, generally microreticulate, with recumbent setae; ventrite I laterally keeled along basal 2/3–3/4, other ventrites without keels; apex ventrite V narrowly truncate to rounded in both sexes; sternite VIII of male Y-shaped; apex of penis slightly mucronate in dorsal view, tip straight and blunt in lateral

view; female sternite VIII with slightly elongate almost parallel-sided basal apodeme; gonocoxite distinctly setose at apex; spermatheca hook-shaped, duct tightly coiled, with small sclerotised swelling at junction with bursa copulatrix.

Notes

Macrolema vittata was described from a single locality, Dawson's River, Moreton Bay, Queensland, based on at least two specimens as two different lengths were given (Baly 1861: 275). There are three specimens with Baly labels in BMNH, but only two are labelled 'M.B.' (Moreton Bay) and these have Baly's handwritten 'type' labels attached. One of these, a male, is more completely labelled from Dawson's River and collected by Diggles, and is hereby designated lectotype. The other specimen from Moreton Bay, a female, becomes a paralectotype. The third specimen carries a handwritten identification label by Baly but appears to have been acquired by Baly from a dealer (Janson) after the original description and it therefore is not a type.

This species has two colour forms. The pale one, without elytral vittae (Fig. 16), dominates the southern (Buladelah to Dorrigo) and northern (Maleny area) extremes of the species' range (Fig. 132). This form was described as *M. marginata* by Jacoby (1898), but without a specific type locality although the holotype is labelled 'Queensland'. The striped form (Fig. 15), described by Baly as *M. vittata*, dominates the central part of the range (Dorrigo to Canoungra). The two forms do not seem to have been collected together, but this may be an artifact of rarity. However they have been collected within a few kilometres of each other on the Dorrigo Plateau. We have dissected males and females from the three centres, Dorrigo ('marginata'), Mount Tambourine ('vittata') and Maleny ('marginata'). There is general similarity in the genitalia, as well as in external features such as antennae, legs, elytral sculpture, ventral thoracic sclerites and the diagnostic abdominal ventrite sculpture. The Maleny specimens are slightly smaller and have slightly smaller genitalia, but no other obvious differences. We therefore consider *M. vittata* a senior synonym of *M. marginata* (**syn. nov.**).

Colour variation in this species may reflect a mimicry complex involving a species of galerucine, *Oides fryii* Clark, which commonly occurs with *Macrolema vittata* (label records and personal observation). *Oides fryii* also has two colour forms, one entirely pale brown with paler elytral margins and the other with two vittae on each elytron; in both the outer edges of the tibiae are black. The pale colour form dominates at the southern (Buladelah to Dorrigo) and northern (Maleny) extremes of this species' range, while the striped form predominates in the centre of the range (Dorrigo to Brisbane). The matching ranges and colour patterns seem more than co-incidental. *Oides* species are slow-moving and conspicuous and the genus belongs to a subfamily well-known to include chemically protected species (Pasteels, Braekman & Daloze 1988; Pasteels, Rowell-Rahier, Braekman & Daloze 1994).

Macrolema vittata is a relatively common and widespread species of the border and adjacent ranges between New South Wales and Queensland, from Dorrigo Plateau to Maleny, at c. 20–550m elevation. The old North Queensland specimen from Jacoby's collection is likely to be mislabelled, as is the North Queensland specimen from the Brown collection (see also *M. quadrivittata*). The 45 specimens of this species were collected from November to January.

A single larva of an unknown spilopyrine genus was collected in 1993 by CAMR and later described (Fig. 17; Reid 2000). This larva was collected at the entrance to Red Cedar Flora Reserve, at exactly the same location as a specimen of *M. vittata* collected by our colleague José Jurado-Rivera 12 years later. No other spilopyrines are known from this locality, therefore we consider this larva to be *M. vittata*. Details are provided under the generic description.

Acknowledgements

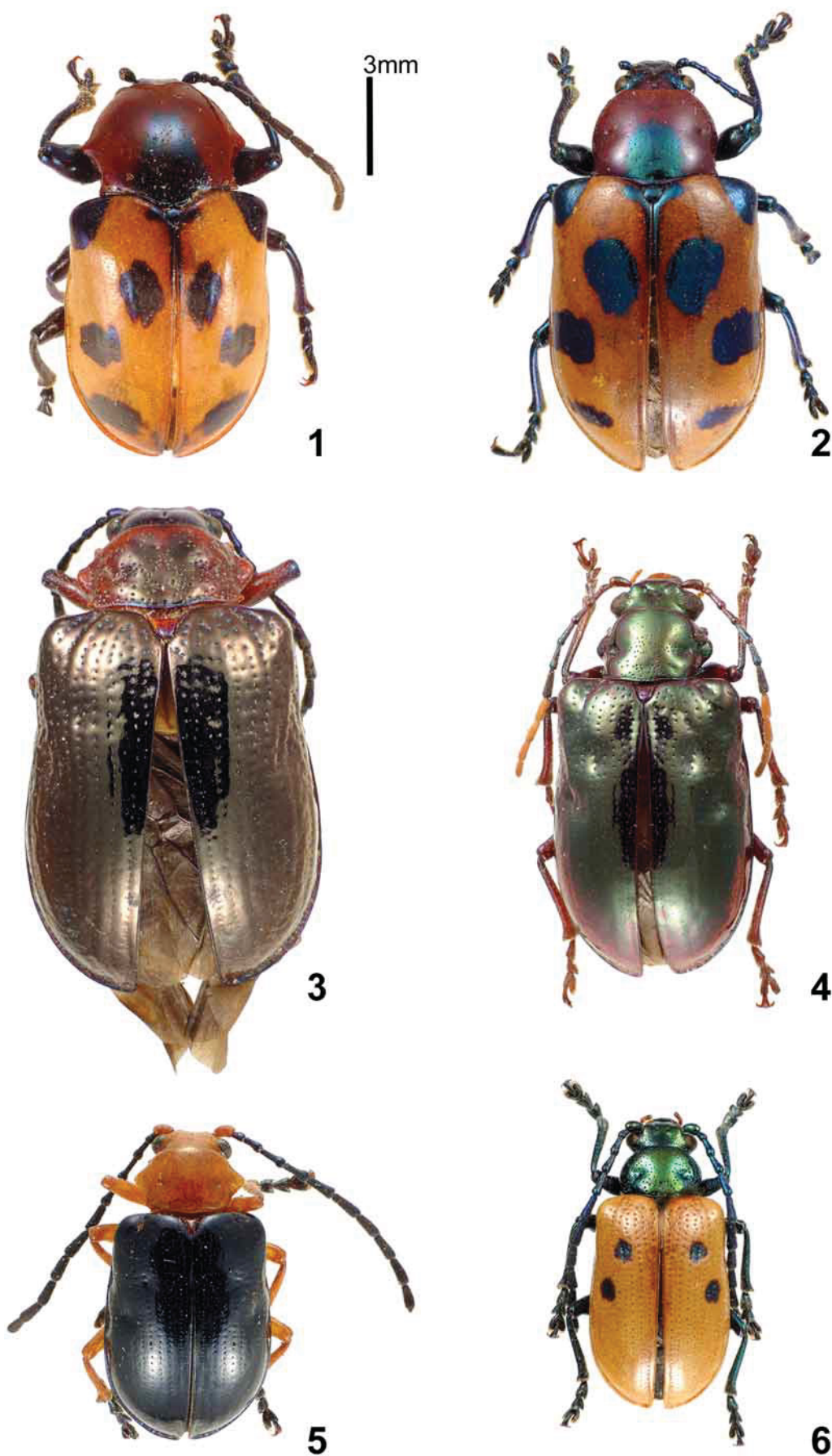
This project was funded by a grant to CAMR from the Australian Biological Resources Study, to which we are extremely grateful. We thank the following curators and colleagues for the loan of material in their care: Greg Daniels (UQM), David Furth (MCZ), John Lawrence (ANIC), Eric Matthews (SAM), Geoff Monteith

(QMB), Sharon Shute (BMNH), Adam Slipinski (ANIC), the late Ross Storey (QDPIM), Ken Walker (MVM), Tom Weir (ANIC). We thank CSIRO Publishing (<http://www.publish.csiro.au/nid/120/paper/IT00042.htm>) for permission to reproduce Figure 17. Particular thanks to Sharon Shute for type data and information on the Baly and Jacoby collections, Tom Weir for information about the Ohlmus collection and Ken Walker for information about the Oke collection. We are also grateful to our colleagues José Jurado-Rivera (University of the Balearic Islands) and Geoff Monteith for recently collected material. John Lawrence (Gympie) kindly provided advice concerning nomenclature of the more esoteric genital sclerites.

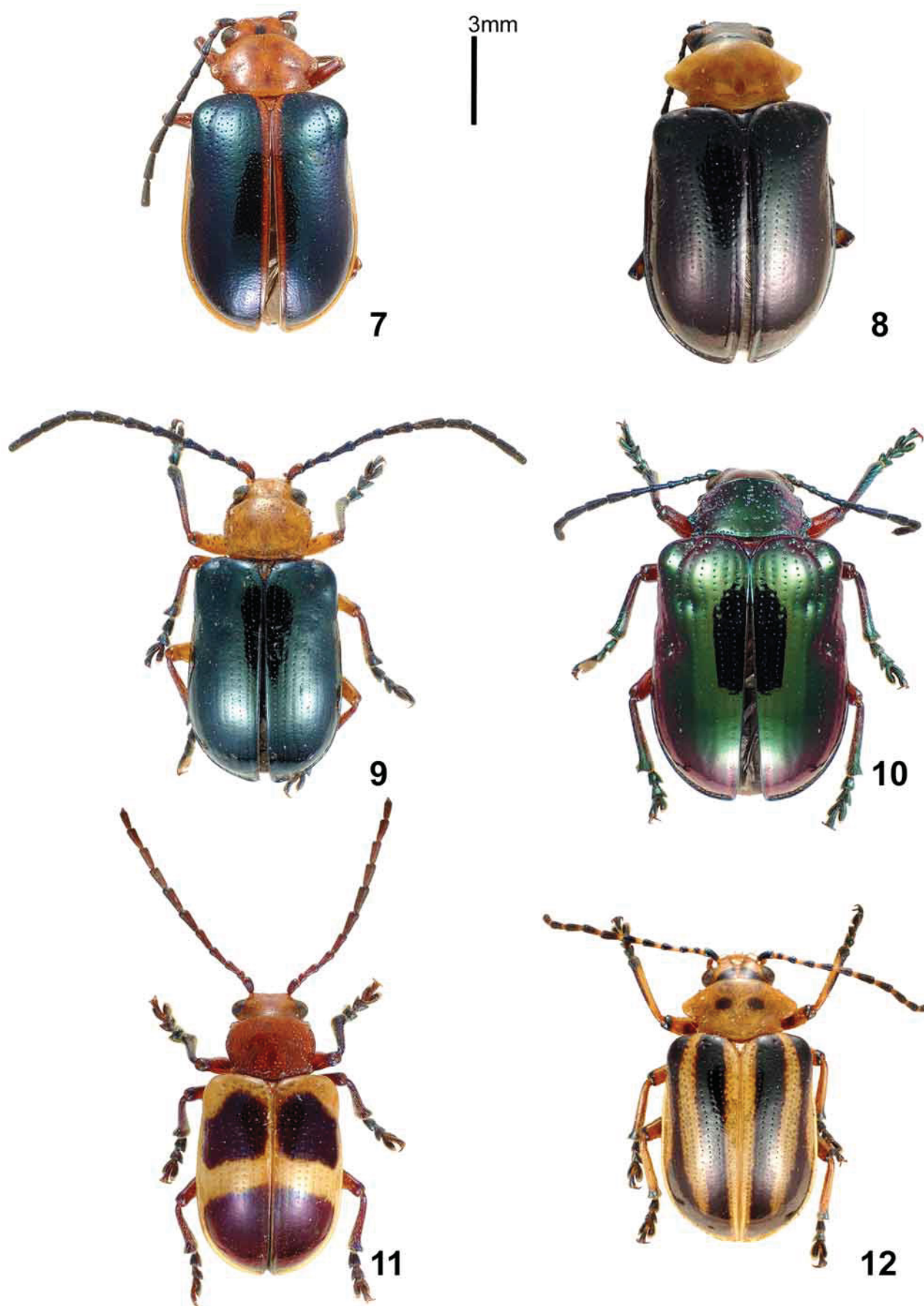
References

- Anonymous (2009) Maps: Australia's bioregions: IBRA. <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html#ibra> [seen: 30 June 2009]
- Baly, J.S. (1860) Descriptions of new genera and species of Eumolpidae. *Journal of Entomology*, 1, 23–36.
- Baly, J.S. (1861) Descriptions of new genera and species of Phytophaga. *Journal of Entomology*, 1, 275–302.
- Bell, H.L. (1984) The importance of foothill forest in the diversity of rainforest birds in New Guinea. *Emu* 84, 225–235.
- Bowditch, F.C. (1913) New species of *Macrogonus* (Coleop.). *Entomological News, Philadelphia*, 24, 268–9.
- Chapuis, F. (1874) Histoire naturelle des Insectes. Genera des Coléoptères. Vol. 11. Famille des Phytophages. Paris, 420pp.
- Clark, H. (1864) Descriptions of new Australian Phytophaga. *Journal of Entomology*, 2, 247–263, plate 12.
- Clavareau, H. (1913) Chrysomelidae: 1. Sagrinae, 2. Donaciinae, 3. Orsodacninae, 4. Criocerinae. *Coleopterorum Catalogus*, 51, 1–103.
- Crowson, R.A. (1953) Classification of the families of British Coleoptera (contd). *Entomologist's monthly Magazine*, 89, 193–198.
- Gomez-Zurita, J., Hunt, T., Kopliku, F. & Vogler, A.P. (2007) Recalibrated tree of leaf beetles (Chrysomelidae) indicates independent diversification of angiosperms and their host herbivores. *PLOS One*, 2(4), 1–8.
- Gomez-Zurita, J., Hunt, T. & Vogler, A.P. (2008) Multilocus ribosomal RNA phylogeny of the leaf beetles (Chrysomelidae). *Cladistics*, 23, 1–17.
- Gomez-Zurita, J., Jolivet, P. & Vogler, A.P. (2005) Molecular systematics of Eumolpinae and the relationships with Spilopyrinae (Coleoptera, Chrysomelidae). *Molecular Phylogenetics and Evolution*, 34, 584–600.
- Horton, D.R. (1996) Aboriginal Australia wallmap. Aboriginal Studies Press, AIATSIS. http://www.aboriginaleducation.sa.edu.au/files/pages/aboriginal_aust/ab_aust_qld.pdf [seen 10 April 2010]
- International Union for Conservation of Nature (2001) IUCN Red List categories and criteria: Version 3.1. Gland (Switzerland) and Cambridge (UK): IUCN Species Survival Commission, IUCN. ii+30pp.
- Jacoby, M. (1894) Descriptions of new genera and species of phytophagous Coleoptera, obtained by W. Doherty in the Malayan archipelago. *Novitates Zoologicae*, 1, 267–330.
- Jacoby, M. (1895) Descriptions of new species of phytophagous Coleoptera from the Indo- and Austro-Malayan regions. *Stettiner entomologische Zeitung*, 56, 52–80.
- Jacoby, M. (1898) New species of phytophagous Coleoptera from Australia and the Malayan regions. *Annales de la Société Entomologique de Belgique*, 42, 350–380.
- Jacoby, M. & Clavareau, H. (1904) Coleoptera Phytophaga fam. Crioceridae. *Genera Insectorum*, 4(23), 1–40, plates 1–5.
- Jerez, V. (1996) Biology and phylogenetic remarks of the sub-antarctic genera *Hornius*, *Stenomela* and *Dictyneis* (Chrysomelidae: Eumolpinae), pp. 239–258, in Jolivet, P.H.A. & Cox, M. L. (eds) Chrysomelidae biology, vol. 3, general studies. Academic Publishing, Amsterdam.
- Karren, J.B. (1966) A revision of the genus *Exema* of America, north of Mexico (Chrysomelidae, Coleoptera). *Kansas University Science Bulletin*, 46, 647–695.
- Lacordaire, J.T. (1845) Monographie des Coléoptères subpentamères de la famille des Phytophages. Tome premier. *Mémoires de la Société Royale des Sciences de Liège*, 3(1), i–liii + 1–740.
- Lawrence J.F., Beutel, R.G., Leschen, R.A.B. & Slipinski, S.A. (2010) 2. Glossary of morphological terms. In: *Handbuch der Zoologie/Handbook of Zoology. Band/Volume IV Arthropoda: Insecta Teilband/Part 38. Coleoptera, Beetles. Volume 2. Morphology and Systematics (Polyphaga partim)*. (Eds RG Beutel, RAB Leschen and JF Lawrence) pp. 9–20. W. DeGruyter, Berlin.
- Lea, A.M. (1921a) On Coleoptera, mostly from Queensland. *Memoirs of the Queensland Museum*, 7(3), 182–240.
- Lea, A.M. (1921b) Descriptions of new species of Australian Coleoptera. Part XVII. *Proceedings of the Linnean Society of New South Wales*, 46(3), 351–369.
- Lea, A.M. (1922) On Australian Coleoptera. Part IV. Chrysomelidae. *Records of the South Australian Museum*, 2(2),

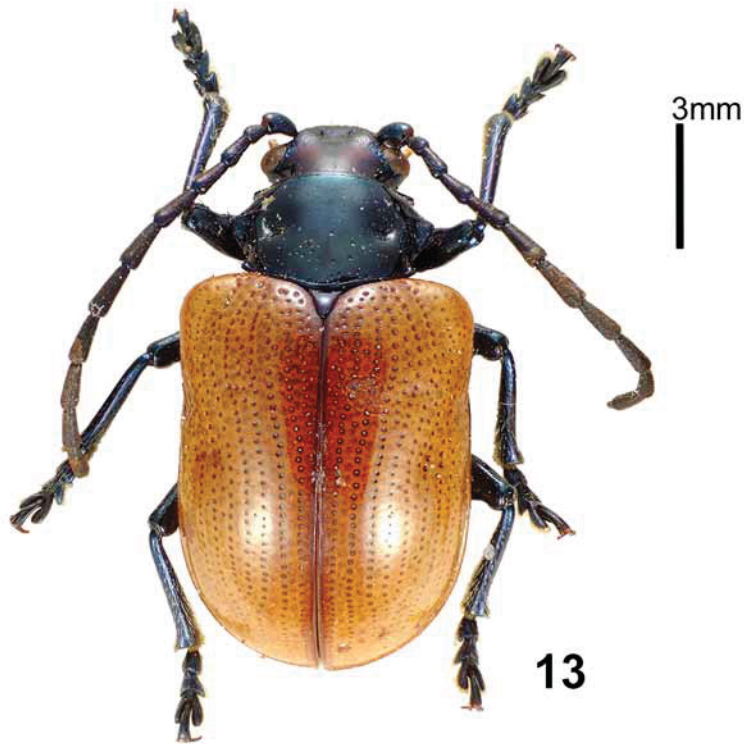
- Lefèvre, E. (1885) Eumolpidarum hucusque cognitarum catalogus, sectionum conspectu systematico, generum sicut et specierum nonnullarum novarum descriptionibus adjunctus. *Mémoires de la Société royale des sciences de Liège*, (2) 11, 3–172.
- Monrós, F. (1951) Notas sobre Criocerinae. *Acta zoologica Lilloana*, 11, 467–482.
- Monrós, F. (1958) Consideraciones sobre la fauna del Sur de Chile y revision de la tribus Stenomelini (Coleoptera, Chrysomelidae). *Acta zoologica Lilloana*, 15, 143–153.
- Musgrave, A. (1932) Bibliography of Australian entomology 1775–1930 with biographical notes on authors and collectors. Royal Zoological Society of New South Wales, Sydney. viii+380pp.
- Pasteels, J.M., Braekman, J.-C. & Daloze, D. (1988) Chemical defence in the Chrysomelidae, pp 233–252 in: Jolivet, P., Petitpierre, E. & Hsiao, T.H. (eds) The biology of Chrysomelidae. Junk, Dordrecht.
- Pasteels, J.M., Rowell-Rahier, M., Braekman, J.-C. & Daloze, D. (1994) Chemical defence of adult leaf beetles updated. pp. 289–301, in: Jolivet, P.H., Cox, M.L. & Petitpierre, E. (eds), Novel aspects of the biology of Chrysomelidae. Kluwer, Amsterdam.
- Pasteur, Georges (1982) “A classificatory review of mimicry systems”. *Annual Review of Ecology and Systematics*, 13, 169–199.
- Pic, M. (1916) Genres et sous-genres nouveaux. *Mélanges Exotico-Entomologiques*, Moulin, 19, 1–5.
- Reid, C.A.M. (1991) A new genus of Cryptocephalinae from Australia (Coleoptera: Chrysomelidae). *Entomologica scandinavica*, 22, 139–157.
- Reid, C.A.M. (1992) Revision of the genus *Cheiloxena* Baly (Coleoptera: Chrysomelidae: Eumolpinae). *Memoirs of the Museum of Victoria*, 53(1), 101–114.
- Reid, C.A.M. (1995) A cladistic analysis of subfamilial relationships in the Chrysomelidae *sensu lato* (Chrysomeloidea), pp. 559–631, in Pakaluk, J. and Slipinski, S. A. (eds) Biology, phylogeny and classification of Coleoptera. Papers celebrating the 80th birthday of Roy A. Crowson. Muzeum i Instytut Zoologii PAN, Warszawa.
- Reid, C.A.M. (2000) Spilopyrinae Chapuis: a new subfamily in the Chrysomelidae and its systematic placement (Coleoptera). *Invertebrate Taxonomy*, 14, 837–862.
- Seeno, T.N. & Wilcox, J.A. (1982) Leaf beetle genera (Coleoptera: Chrysomelidae). *Entomography*, 1, 1–221.
- Tanner, V.M. (1927) A preliminary study of the genitalia of female Coleoptera. *Transactions of the American entomological Society*, 53, 5–50, plates 2–15.



FIGURES 1–6. Habitus: 1, male *Allsortsia maculata* (Lea); 2, female *A. maculata*; 3, *Macrolema aenescens* (Bowditch); 4, *M. albascutica* Reid & Beatson; 5, *M. atripennis* (Bowditch); 6, *M. dickdavesi* Reid & Beatson.



FIGURES 7–12. Habitus of *Macrolema* species: 7, *M. giya* Reid & Beatson; 8, *M. karimui* Reid & Beatson; 9, *M. longicornis* Jacoby; 10, *M. metallica* (Lea); 11, *M. pulchra* Reid & Beatson; 12, *M. quadrivittata* (Jacoby).



13



14



15



16

FIGURES 13–16. Habitus of *Macrolema* species: 13, *M. submetallica* (Jacoby); 14, *M. ventralis* (Lea); 15, *M. vittata* Baly, dark form; 16, *M. vittata*, pale form.

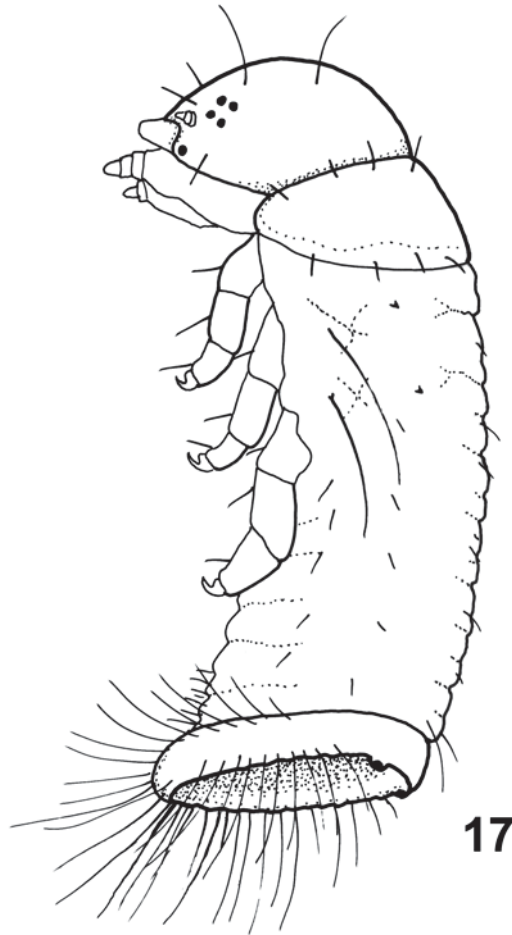
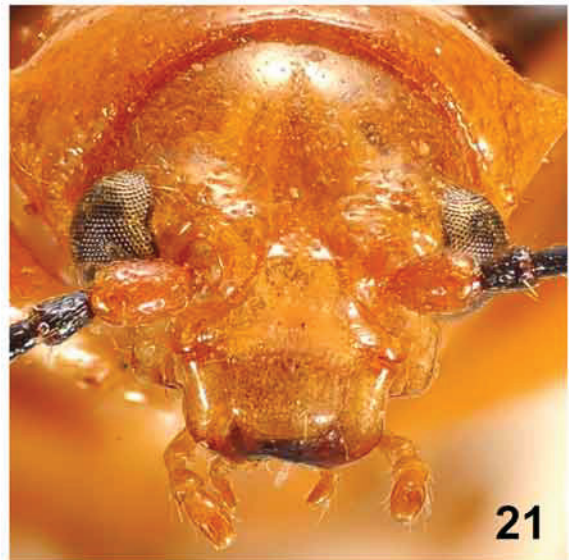
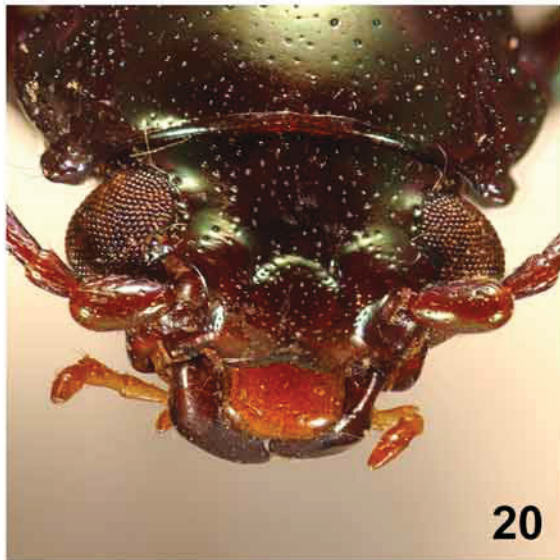
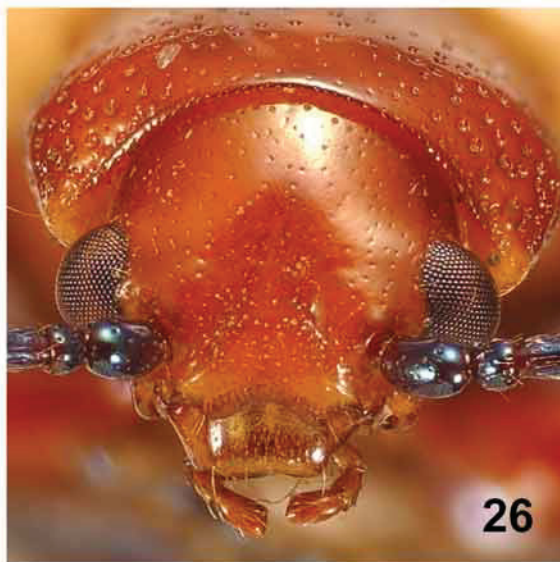


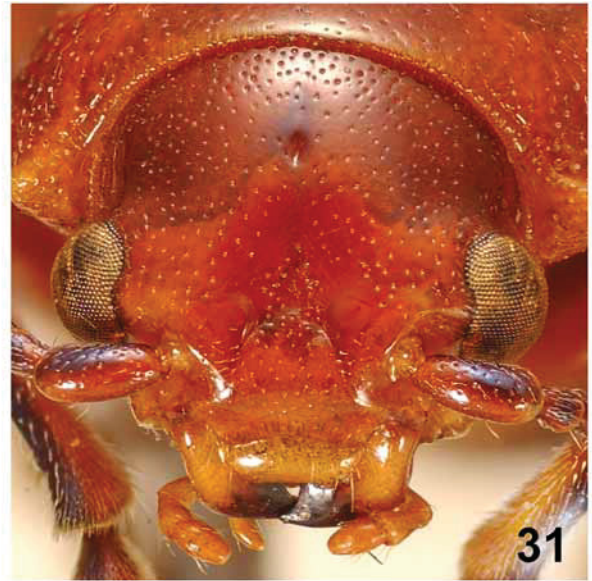
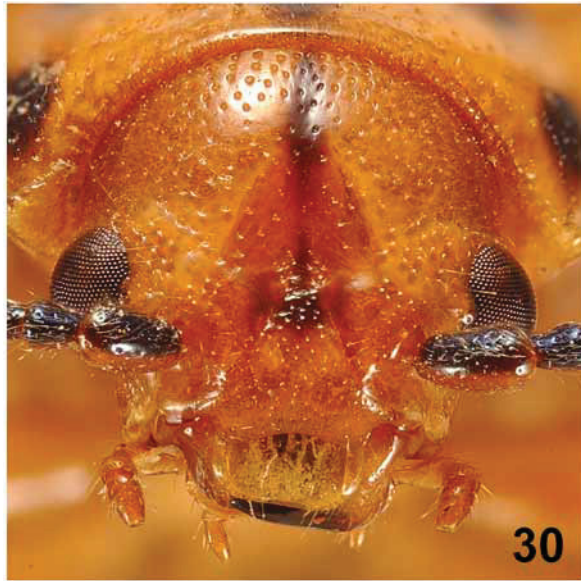
FIGURE 17. Putative first instar larva of *Macrolema vittata* Baly. Reproduced, with permission, from *Invertebrate Taxonomy* 14: 842, figure 8.



FIGURES 18–23. Face: 18, *Allsortsia maculata* (Lea); 19, *Macrolema aenescens* (Bowditch); 20, *M. albascutica* Reid & Beatson; 21, *M. atripennis* (Bowditch); 22, *M. dickdaviesi* Reid & Beatson; 23, *M. giya* Reid & Beatson.



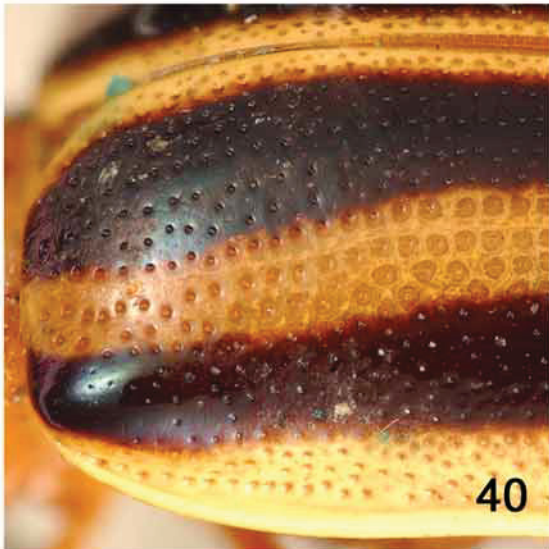
FIGURES 24–29. Face of *Macrolema* species: 24, *M. karimui* Reid & Beatson; 25, *M. longicornis* Jacoby; 26, *M. metallica* (Lea); 27, *M. pulchra* Reid & Beatson; 28, *M. quadrivittata* (Jacoby); 29, *M. submetallica* (Jacoby).



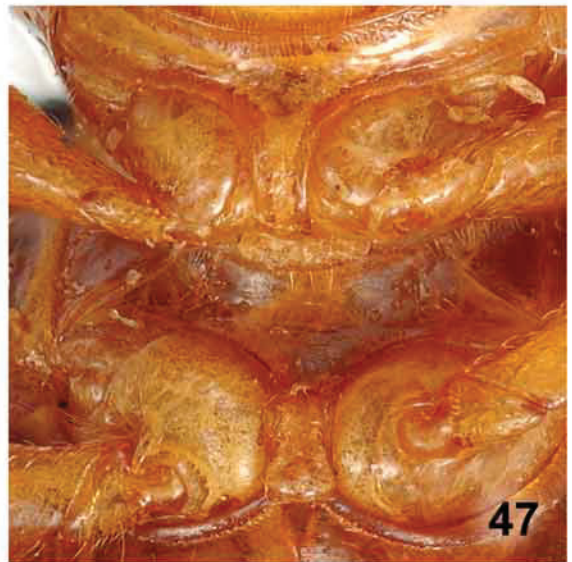
FIGURES 30–31. Face of *Macrolema* species: 30, *M. ventralis* (Lea); 31, *M. vittata* Baly.



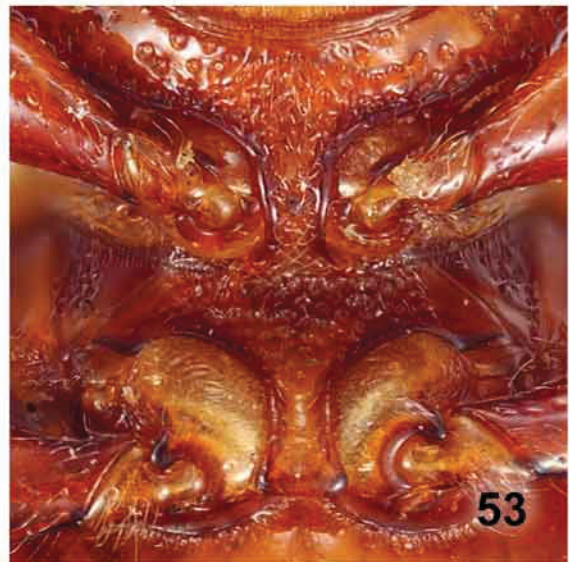
FIGURES 32–37. Antennae of *Macrolema* species: 32, *M. albascutica* Reid & Beatson; 33, *M. longicornis* Jacoby; 34, *M. pulchra* Reid & Beatson; 35, *M. quadrivittata* (Jacoby); 36, *M. ventralis* (Lea); 37, *M. vittata* Baly.



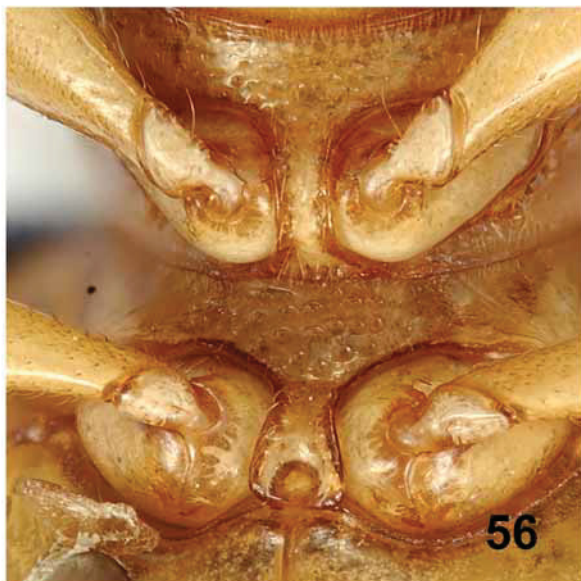
FIGURES 38–43. Dorsolateral view of elytral base: 38, *Macrolema longicornis* (Jacoby); 39, *M. metallica* (Lea); 40, *M. vittata* Baly. Epipleural base: 41, *Allsortsia maculata* Reid & Beatson; 42, *Macrolema quadrivittata* (Jacoby); 43, *M. vittata* Baly.



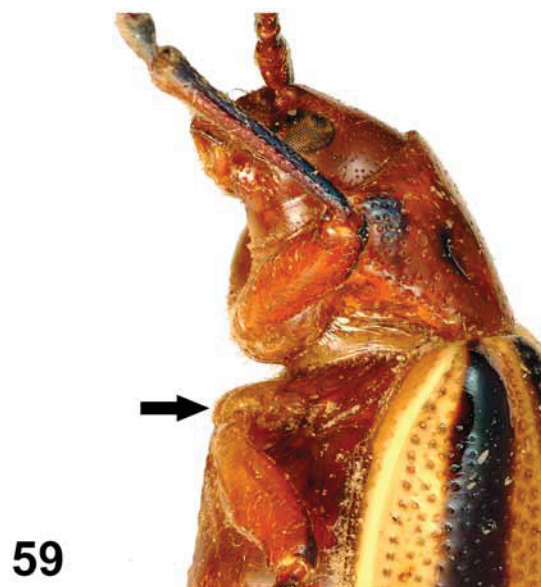
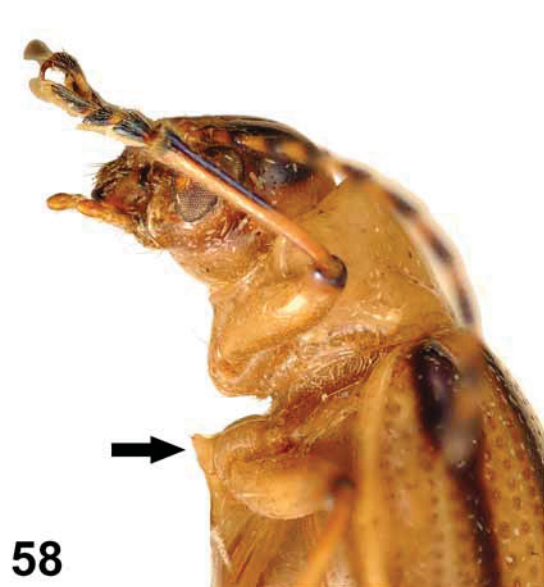
FIGURES 44–49. Pterothoracic venter: 44, *Allsortsia maculata* (Lea); 45, *Macrolema aenescens* (Bowditch); 46, *M. albascutica* Reid & Beatson; 47, *M. atripennis* (Bowditch); 48, *M. dickdaviesi* Reid & Beatson; 49, *M. giya* Reid & Beatson.



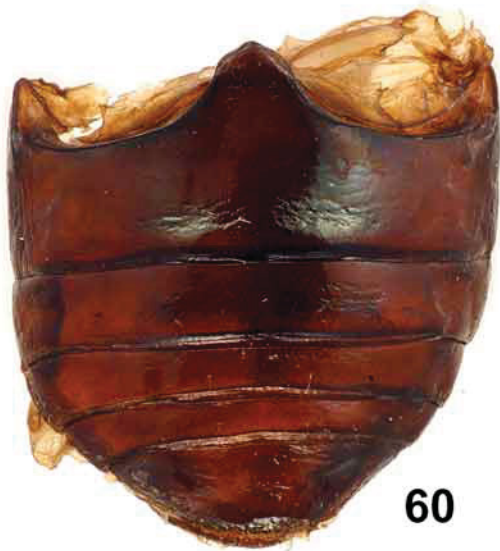
FIGURES 50–55. Pterothoracic venter of *Macrolema* species: 50, *M. karimui* Reid & Beatson; 51, *M. longicornis* Jacoby; 52, *M. metallica* (Lea); 53, *M. pulchra* Reid & Beatson; 54, *M. quadrivittata* (Jacoby); 55, *M. submetallica* (Jacoby).



FIGURES 56–57. Pterothoracic venter of *Macrolema* species: 56, *M. ventralis* (Lea); 57, *M. vittata* Baly.



FIGURES 58–59. Lateral view of pterothorax of *Macrolema* species, showing profile of mesoventrite: 58, *M. quadrivittata* (Jacoby); 59, *M. vittata* Baly.



60



61



62



63

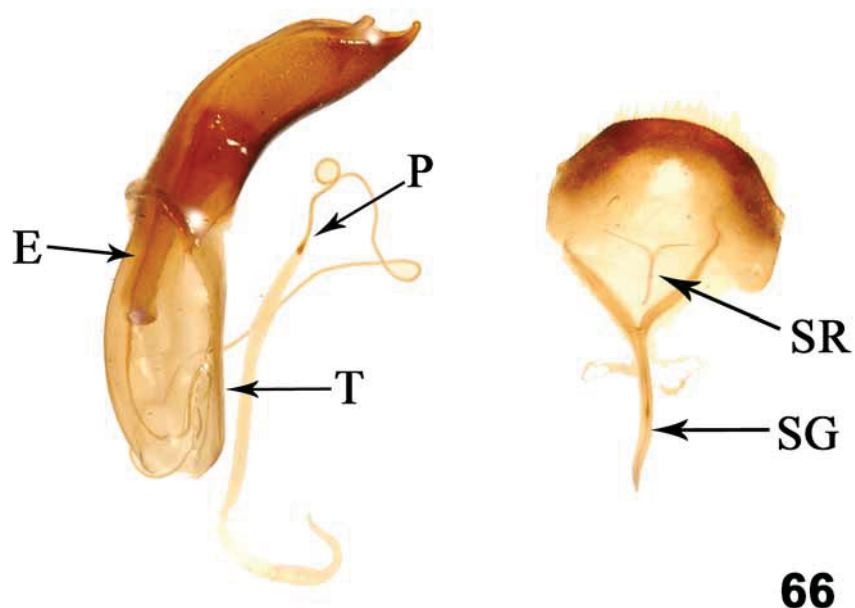


64



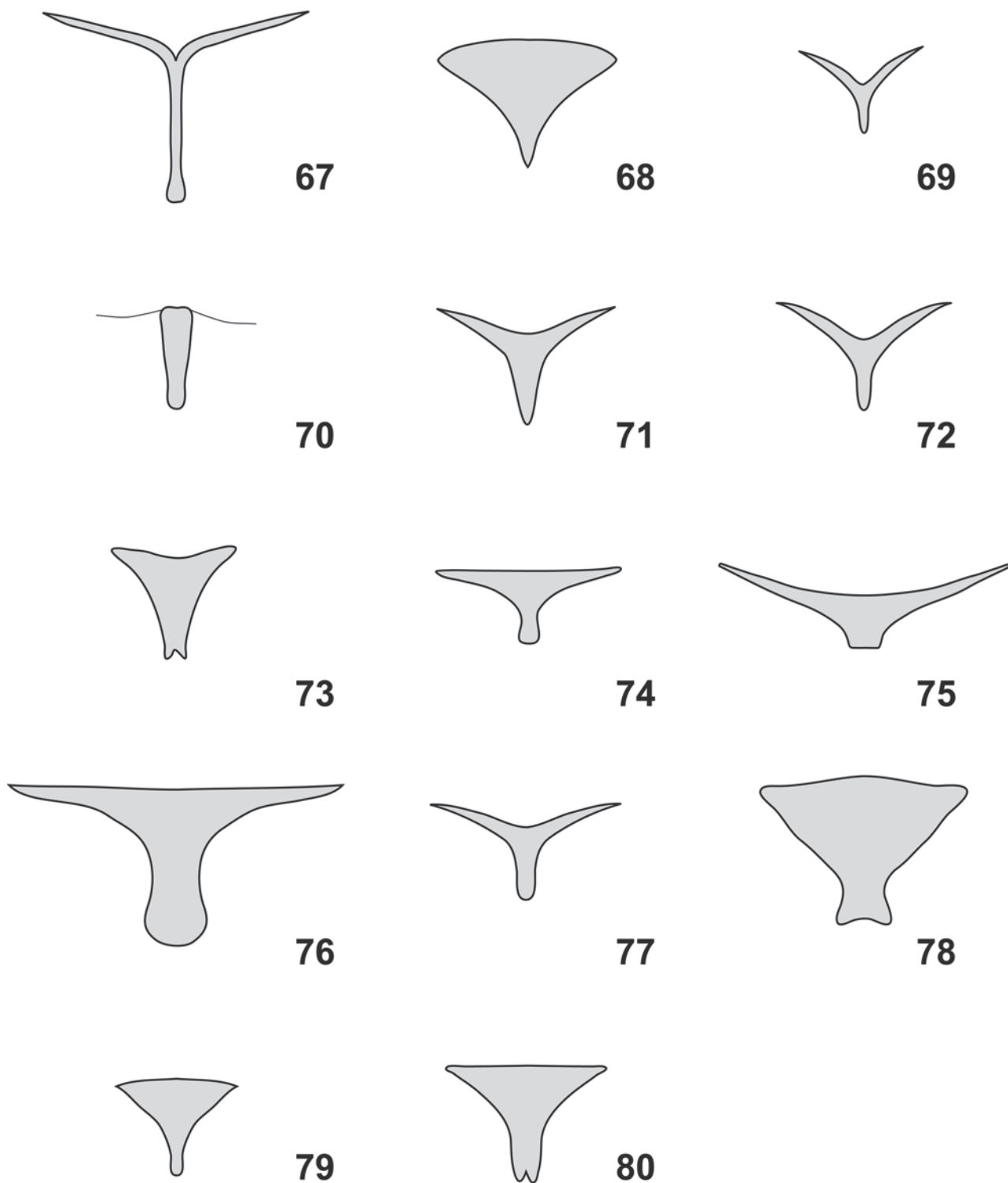
65

FIGURES 60–65. Abdominal ventrites: 60, *Allsortsia maculata* (Lea); 61, *Macrolema albascutica* Reid & Beatson; 62, *M. longicornis* Jacoby; 63, *M. metallica* (Lea); 64, *M. ventralis* (Lea); 65, *M. vittata* Baly.

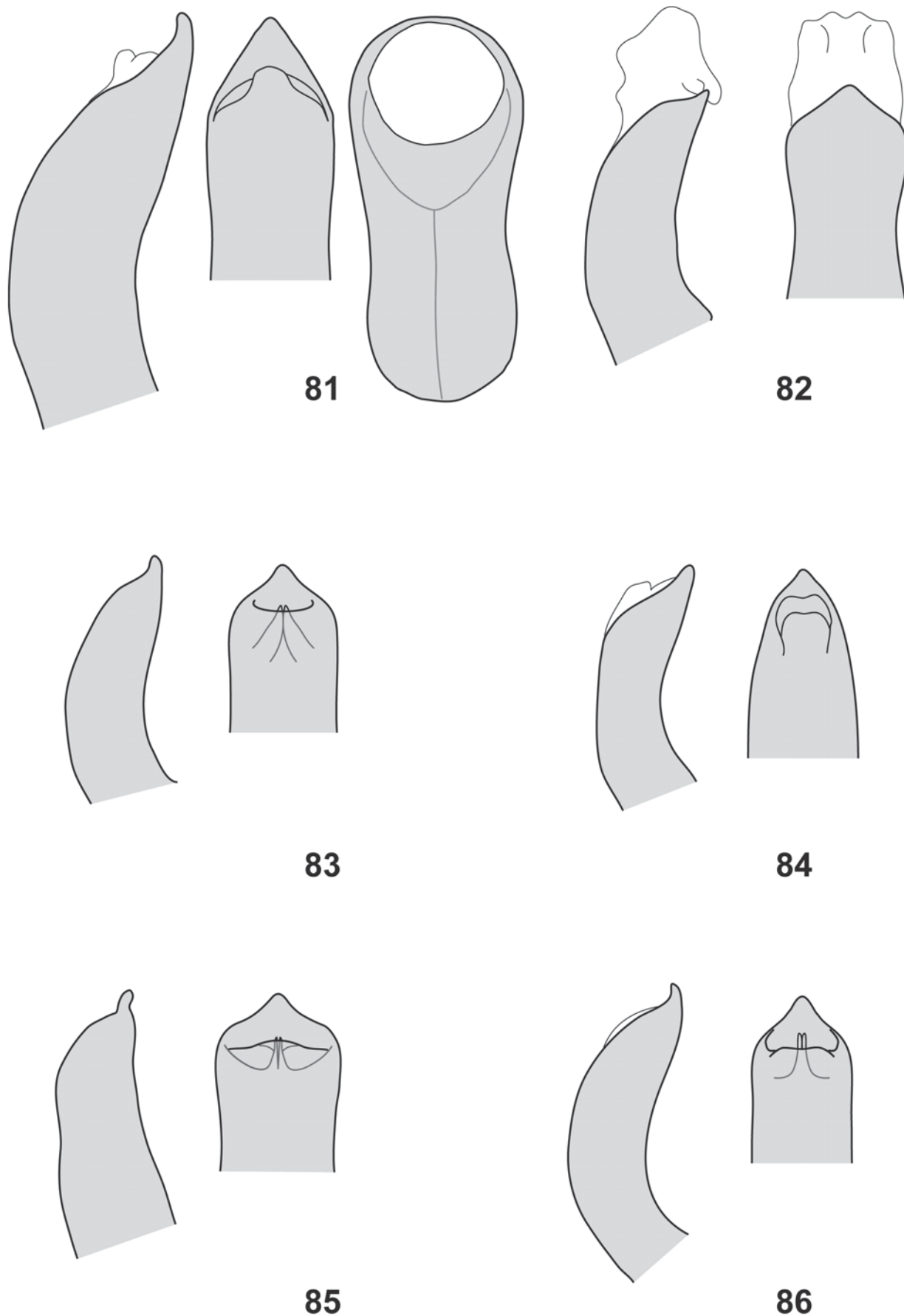


66

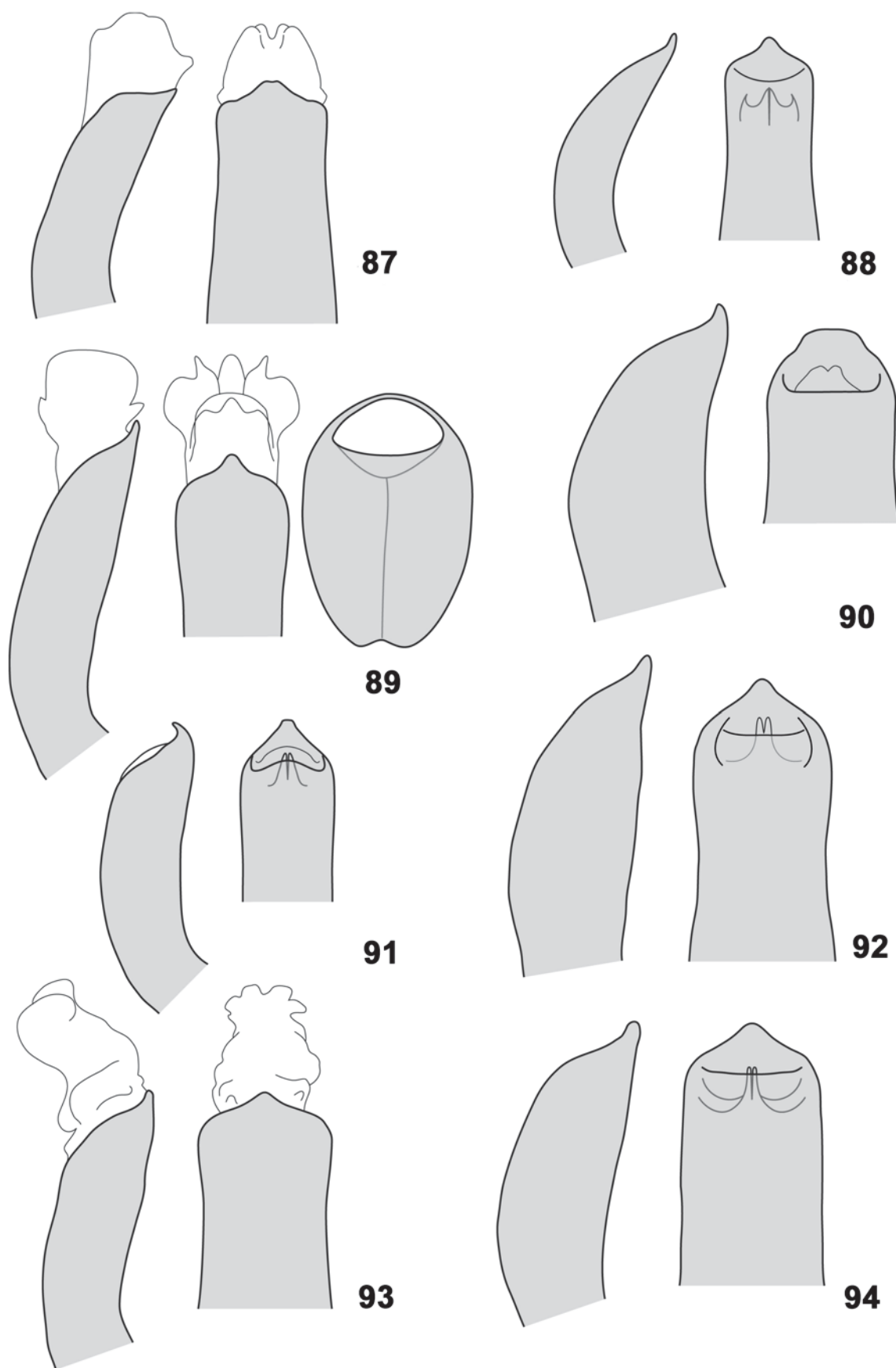
FIGURES 66. Male genitalia of *Allsortsia maculata* (Lea), showing endophallic sclerite (E), tegmen (T), spiculum relictum (SR), spiculum gastrale (SG), sperm pump (P) in vas deferens.



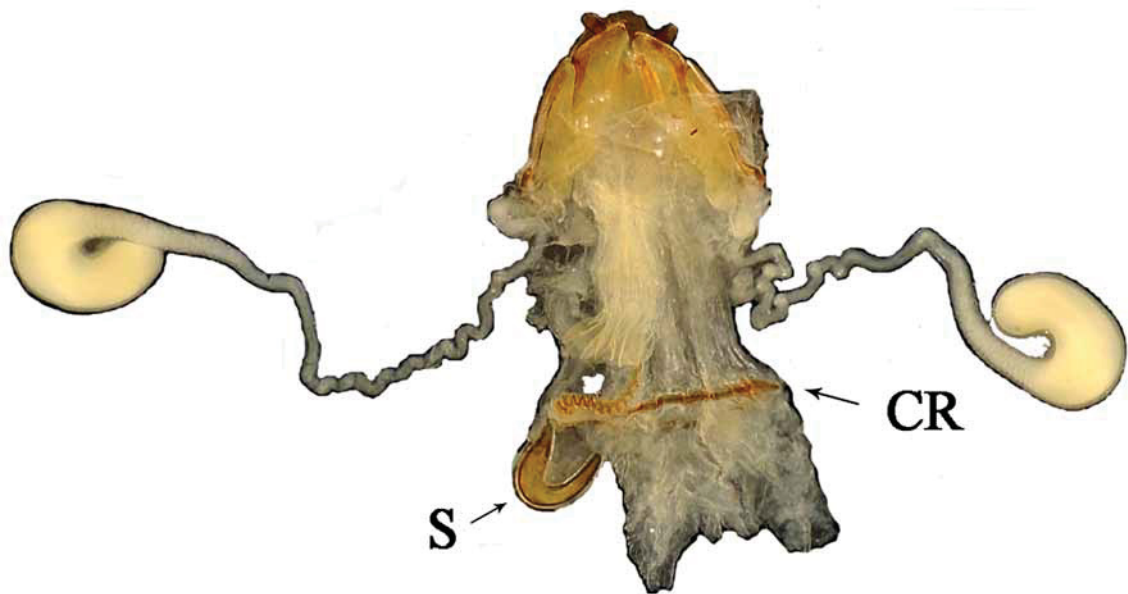
FIGURES 67–80. Male sternite 8 (spiculum relictum) (all drawn to scale): 67, *Allsortsia maculata* Reid & Beatson; 68, *Macrolema albascutica* Reid & Beatson; 69, *M. aripennisi* (Bowditch); 70, *M. dickdaviessi* Reid & Beatson; 71, *M. giya* Reid & Beatson; 72, *M. longicornis* Jacoby; 73, *M. metallica* (Lea); 74, *M. pulchra* Reid & Beatson; 75, *M. quadrivittata* (Jacoby); 76, *M. submetallica* (Jacoby); 77, *M. ventralis* (Lea); 78, *M. vittata* Baly (dark form); 79, *M. vittata* Baly (pale form, Maleny); 80, *M. vittata* Baly (pale form, Dorrigo).



FIGURES 81–86. Penis lateral and dorsal (all drawn to same scale): 81, *Allsortsia maculata* Reid & Beatson (including tegmen); 82, *Macrolema albascutica* Reid & Beatson; 83, *M. atripennis* (Bowditch); 84, *M. dickdavesi* Reid & Beatson; 85, *M. giya* Reid & Beatson; 86, *M. longicornis* Jacoby.

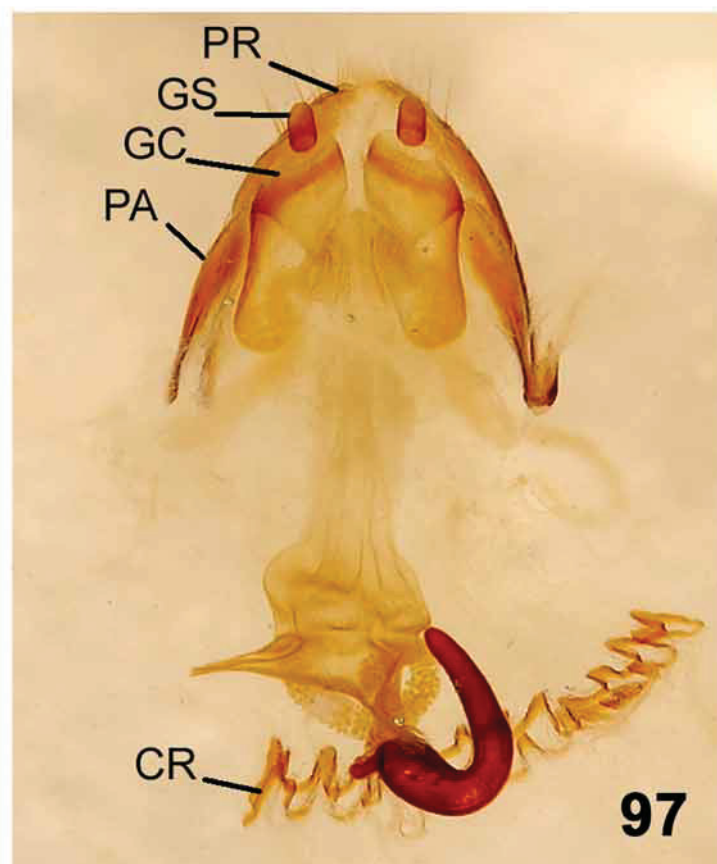
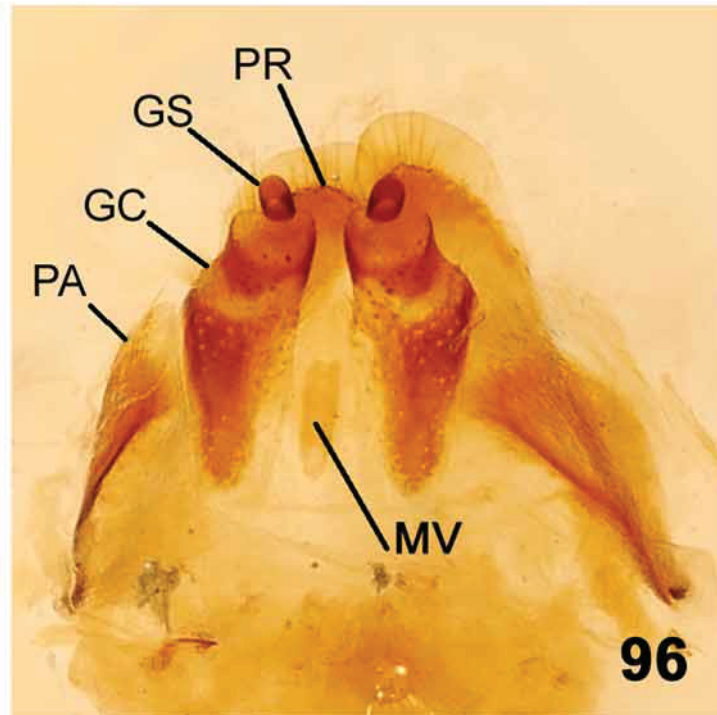


FIGURES 87–94. Penis lateral and dorsal of *Macrolema* species (all drawn to same scale): 87, *M. metallica* (Lea); 88, *M. pulchra* Reid & Beatson; 89, *M. quadrivittata* (Jacoby) (including tegmen); 90, *M. submetallica* (Jacoby); 91, *M. ventralis* (Lea); 92, *M. vittata* Baly (dark form); 93, *M. vittata* Baly (pale form, Maleny); 94, *M. vittata* Baly (pale form, Dorrig).

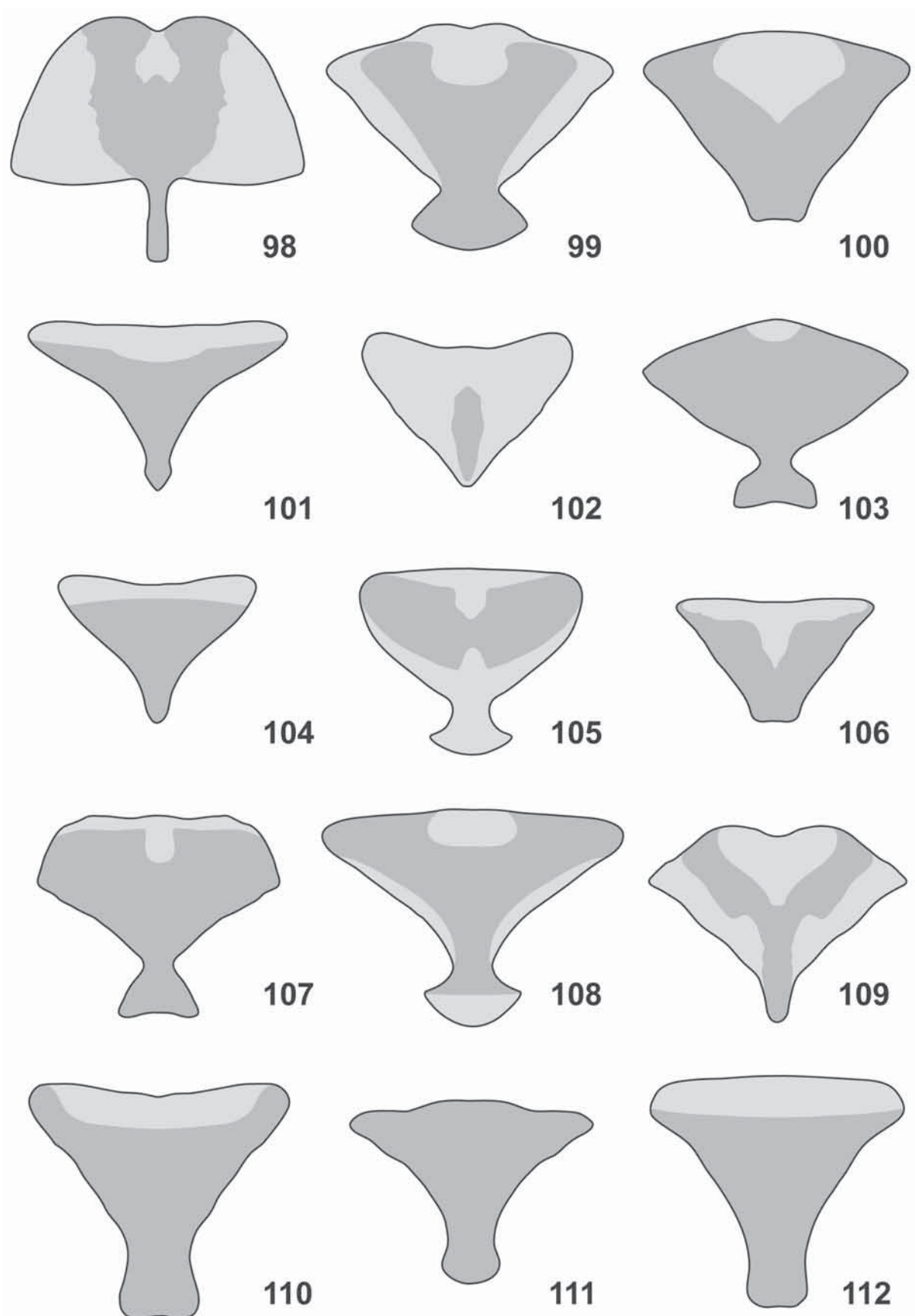


95

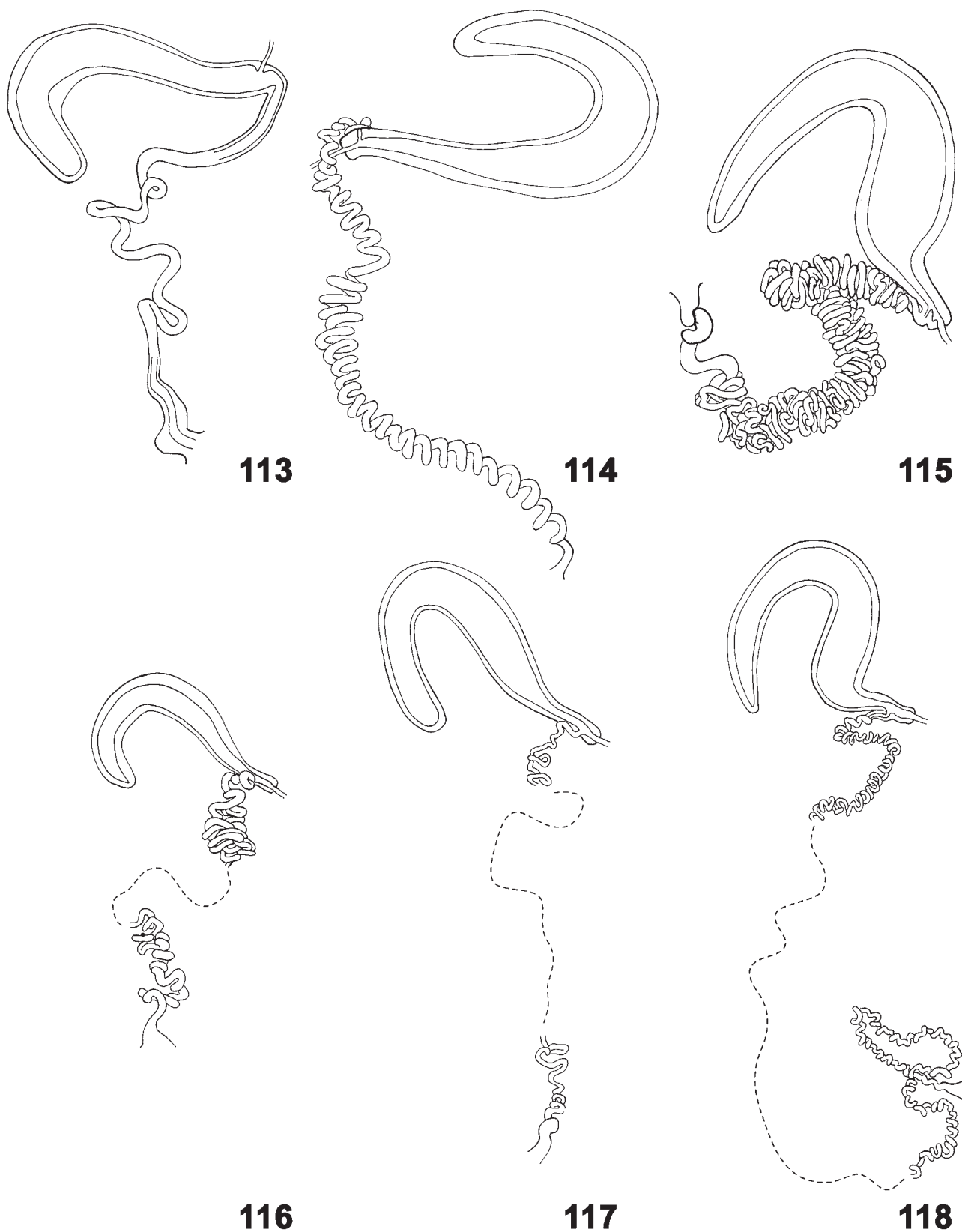
FIGURE 95. Female genitalia (abdominal segment VIII removed) of *Macrolema metallica* (Lea), showing ovipositor, spermatheca (S), secretory glands and chitinring (CR) of rectum.



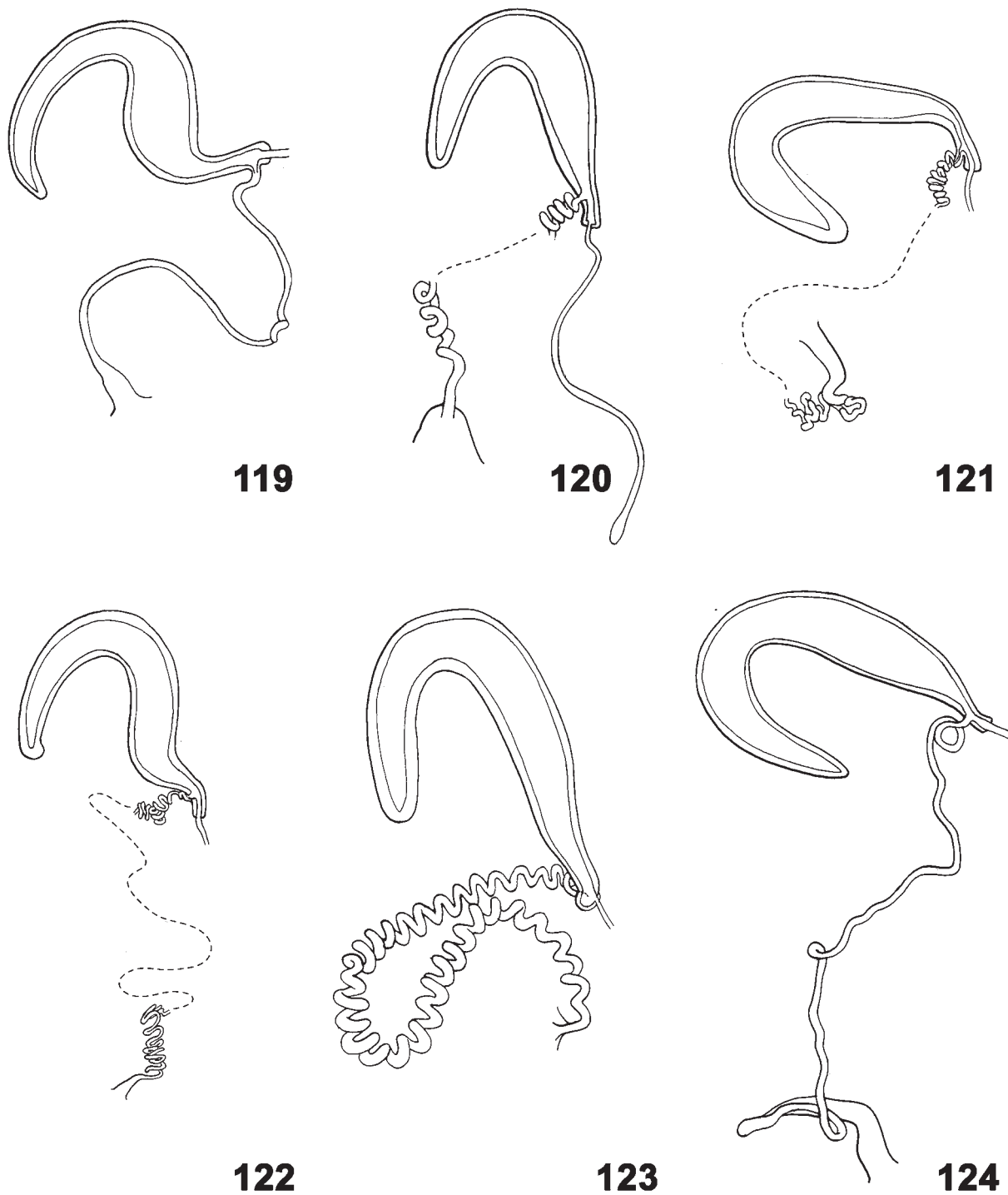
FIGURES 96–97. Female genitalia: 96, *Allsortsia maculata* (Lea); 97, *Macrolema albascutica* Reid & Beatson. CR = chitiner of rectum; GC = gonocoxite; GS = gonostylus; MV = median ventral sclerite; PA = paraproct; PR = proctiger.



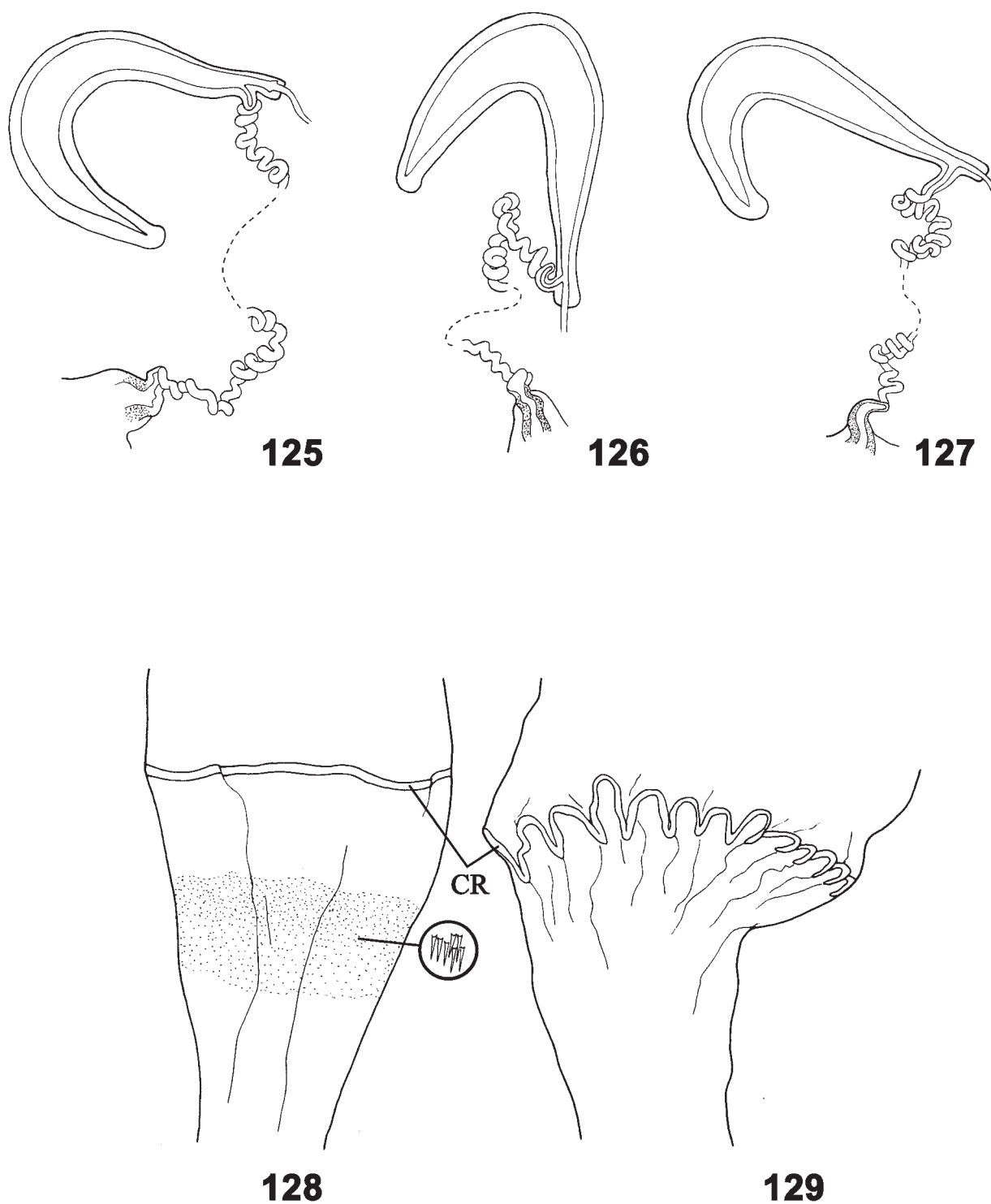
FIGURES 98–112. Female sternite 8 (all drawn to same scale): 98, *Allsortisia maculata* (Lea); 99, *Macrolema aenescens* (Bowditch); 100, *M. albascutica* Reid & Beatson; 101, *M. atripennis* (Bowditch); 102, *M. dickdaviesi* Reid & Beatson; 103, *M. karimui* Reid & Beatson; 104, *M. longicornis* Jacoby; 105, *M. metallica* (Lea); 106, *M. pulchra* Reid & Beatson; 107, *M. quadrivittata* (Jacoby); 108, *M. submetallica* (Jacoby); 109, *M. ventralis* (Lea); 110, *M. vittata* Baly (dark form); 111, *M. vittata* Baly (pale form, Maleny); 112, *M. vittata* Baly (pale form, Dorrigio).



FIGURES 113–118. Spermatheca and duct (all drawn to same scale): 113, *Allsortsia maculata* (Lea); 114, *Macrolema aenescens* (Bowditch); 115, *M. albascutica* Reid & Beatson; 116, *M. atripennis* (Bowditch); 117, *M. dickdaviesi* Reid & Beatson; 118, *M. karimui* Reid & Beatson.



FIGURES 119–124. Spermatheca and duct of *Macrolema* species (all drawn to same scale): 119, *M. longicornis* Jacoby; 120, *M. metallica* (Lea); 121, *M. pulchra* Reid & Beatson; 122, *M. quadrivittata* (Jacoby); 123, *M. submetallica* (Jacoby); 124, *M. ventralis* (Lea).



FIGURES 125–127. Spermatheca and duct of *Macrolema* species (all drawn to same scale): 125, *M. vittata* Baly (dark form, Tambourine); 126, *M. vittata* Baly (pale form, Maleny); 127, *M. vittata* Baly (pale form, Dorrigo).
FIGURES 128–129. Female rectum in ventral view (anus towards bottom): 128, *Allsortsia maculata* (Lea); 129, *Macrolema albascutica* Reid & Beatson. CR = chitin ring; spinules drawn at 4x magnification of rectum.

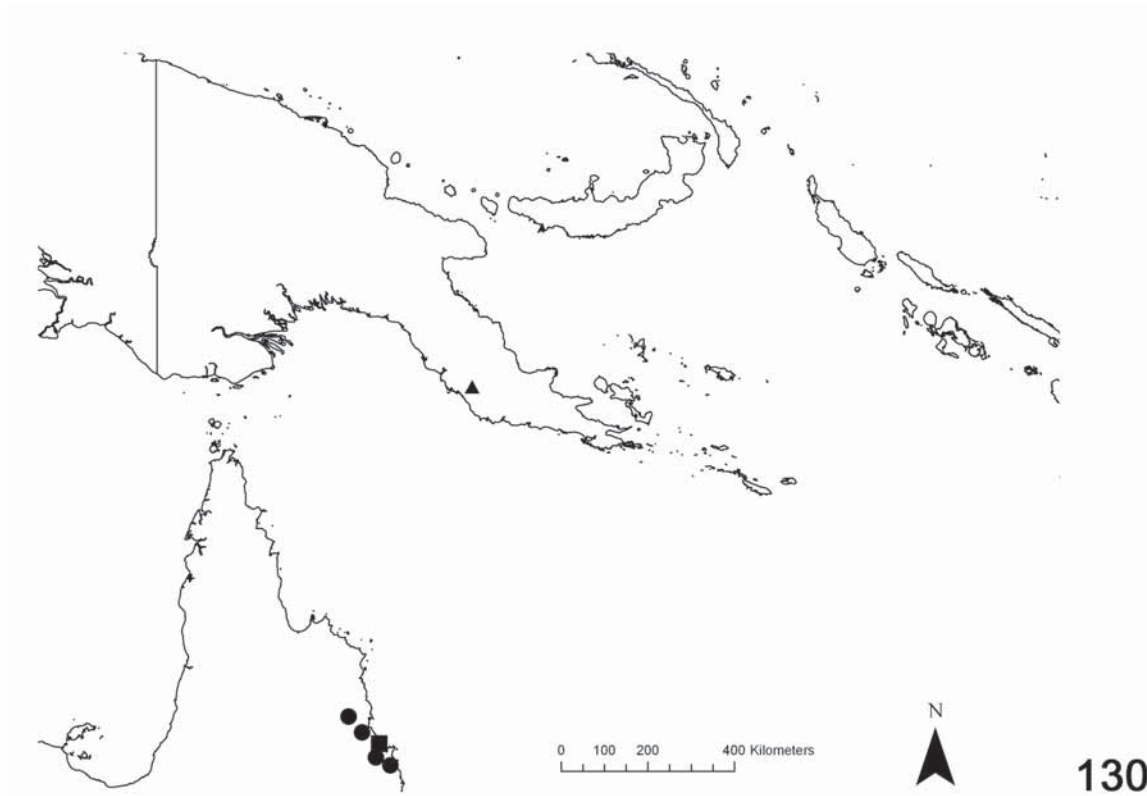


FIGURE 130. Map of New Guinea and northeastern Australia showing distribution of: (■) *Allsortsia maculata* (Lea); (▲) *Macrolema aenescens* (Bowditch); (●) *M. albascutica* sp. nov.

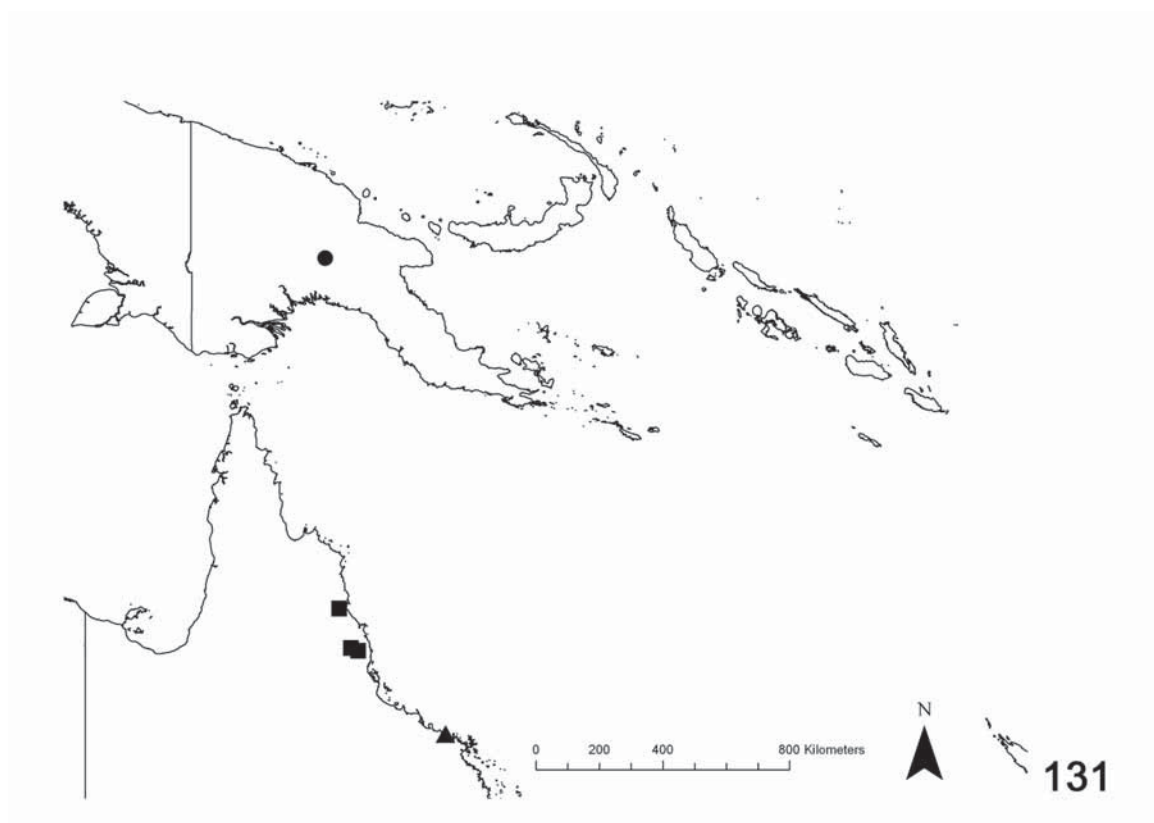


FIGURE 131. Map of New Guinea and northeastern Australia showing distribution of: (■) *Macrolema dickdaviesi* sp. nov., (▲) *M. giya* sp. nov.; (●) *M. karimui* sp. nov.

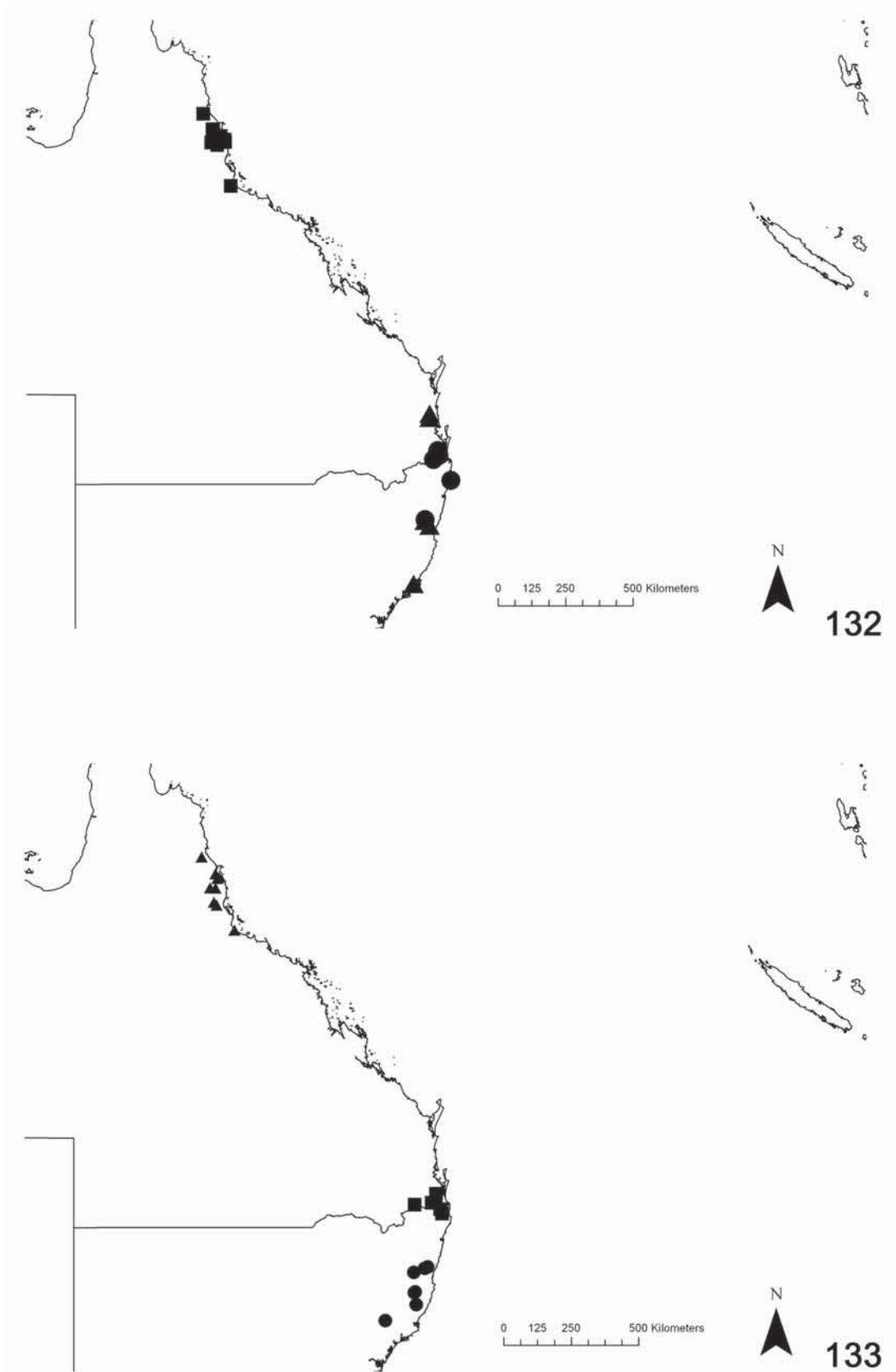


FIGURE 132. Map of eastern Australia showing distribution of: (■) *Macrolema metallica* (Lea); (▲) *M. vittata* Baly, pale form; (●) *M. vittata*, dark form; (○) *M. vittata*, both forms.

FIGURE 133. Map of eastern Australia showing distribution of: (■) *Macrolema longicornis* Jacoby; (▲) *M. quadrivittata* (Jacoby); (●) *M. ventralis* (Lea).

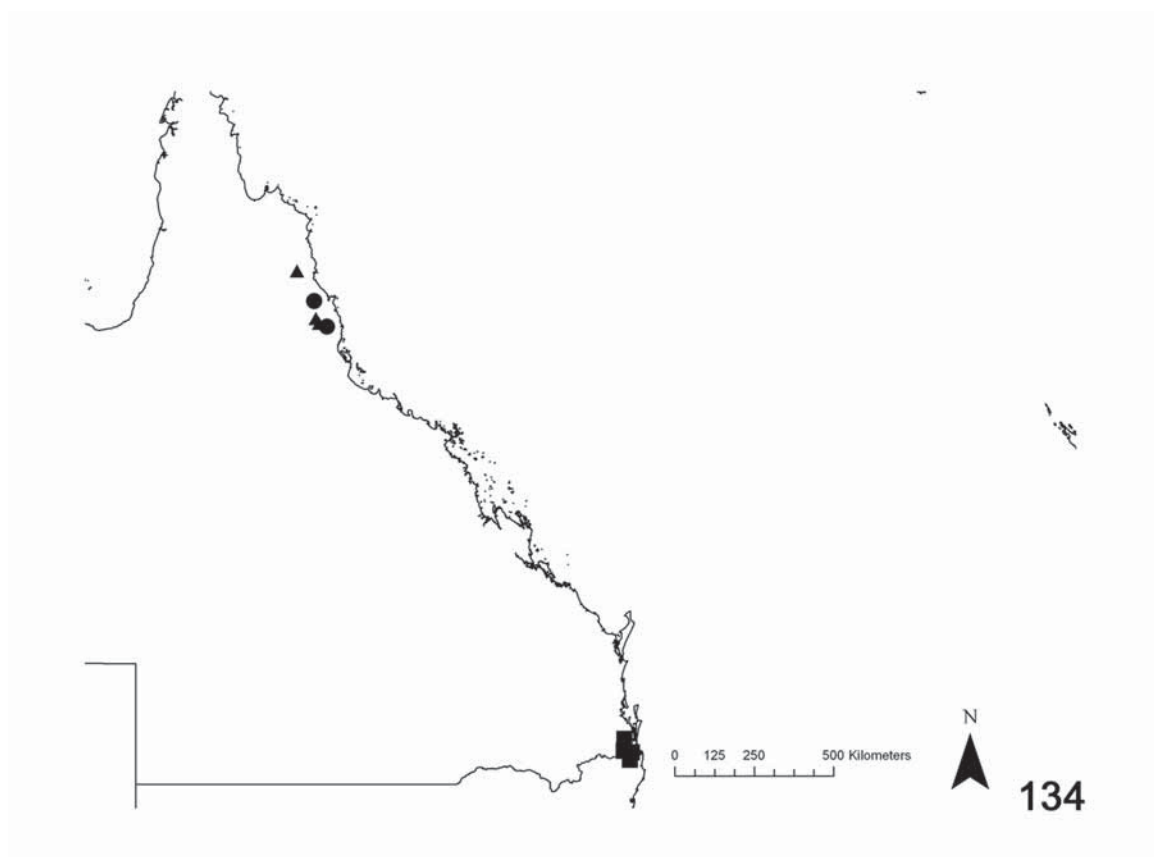


FIGURE 134. Map of eastern Australia showing distribution of: (■) *Macrolema atripennis* (Bowditch); (▲) *M. pulchra* sp. nov., (●) *M. submetallica* (Jacoby).

About the authors

Chris Reid is a Research Scientist at the Australian Museum, Sydney, Australia. Originally from Scotland, he worked in conservation biology in Northern Ireland, England and Portugal until obtaining his honours degree in 1983 in Agricultural Zoology at the University of Newcastle upon Tyne, UK. The honours project was supervised by the late chrysomelid taxonomist Brian Selman (deceased 2009) and sparked Chris' continued interest in this group of beetles. His PhD on the systematics of Cryptocephalinae, under the supervision of the coleopterist John Lawrence, was awarded in 1991 at the Australian National University, Canberra, Australia. Chris has published more than 60 papers on Chrysomelidae. His research focuses on the systematics, classification, taxonomy and biology of this group.

Max Beatson is a technician at the Australian Museum, Sydney, Australia. He has an honours degree in Zoological Science from the University of New South Wales, Sydney, Australia. He is a native of Sydney, where he continues to develop interests in macrophotography, metalwork and martial arts.